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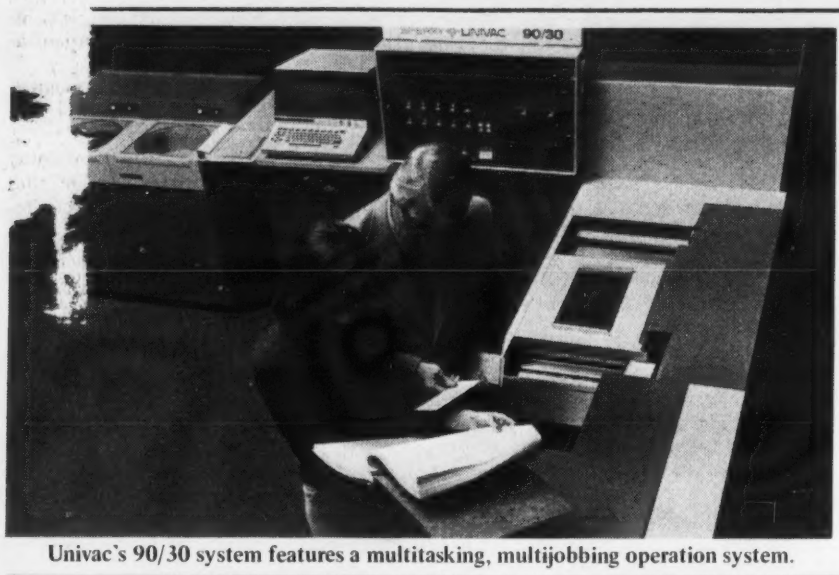
NEWSPAPER



Univac's 90/30 system features a multitasking, multijobbing operation system.

Modular Operating System Highlights Univac 90/30

By Vic Farmer
Of the CW Staff

BLUE BELL, Pa. – Univac unveiled its 90/30 computer system last week with a modularly designed operating system that can provide the user with a wide range of computing power.

The 90/30 spans Univac's 9200 through the 9480 computers and overlaps the low end of its 90/60 configurations. In IBM's line, this span would range from a larger IBM System/3 Model 10 and the Model 15, 370/115, 370/125 and to the low to middle range of the 370/135, according to Univac.

Key to this versatility is the disk-resident operating system, OS/3, which starts out as a barebones system in which the supervisor takes up about 7K of CPU memory. It is capable of multitasking and handling up to seven jobs concurrently.

When all optional modules are plugged in, OS/3 provides a full-blown extended communications system with the supervisor and buffers consuming over 50K of CPU memory. Univac had 80 people spend nearly three years developing OS/3, the firm said.

Semiconductor memory starts at 32K but can be expanded to 256K bytes. The cycle rate is 600 nsec/2 bytes enabling the CPU to perform 139,000 operation/sec, according to Univac.

Allows Emulation

Microprogrammed logic allows emulation of Univac's 9200/9300 applications as well as IBM 360/20 applications. The system also provides from 57.8M to 1,600M bytes of disk storage.

The basic system has 32K memory, 84 basic instructions, six levels of interrupts, two sets of 16 general-purpose registers, interval timer and both an integrated peripheral channel (which supports a CRT console with optional printer, 500 card/min reader, 500 line/min printer and an optional 75- to 160 card/min punch) and an integrated disk adapter supporting two 28.5M-byte disk units.

This basic system will cost about $3,750/mo or $17,198 purchased.

The high end of the 90/30 system adds a multiplexer channel to allow running higher-speed peripherals such as a 1,000 card/min reader, printers up to 2,000 line/min and Univac 9000 series channel adapters.

Two additional selector channels give an 825 kbyte/sec transfer rate per channel. Each supports eight control units which allow up to 16 devices total to be attached.

Optional peripherals include up to 200 in./sec, 1,600 bit/in. Uniservo 20 tape drives or 100M byte/spindle 8430 disk drives. A communications adapter supports up to 12 full-duplex or 24 half-duplex communications lines.

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Sen. Ervin Charges

858 Data Banks Show Regulation a Must

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The results of a four-year study which discovered 858 federal data banks containing over one billion records on American citizens "proves the need for federal privacy legislation to keep Americans from being numbered, punched, processed and filed away." Sen. Sam J. Ervin Jr. (D-N.C.) told a joint Senate committee here recently.

Calling the survey process frustrating and time-consuming due to "the inherent aversion of the executive branch to informing the Congress and the people about what they are doing," Ervin said the results "demonstrate the need for explicit statutory authority for the creation of each data bank as well as prior examination and legislative approval of all decisions to computerize files."

Ervin made the remarks and released the study on the opening day of joint Senate hearings on legislation to provide citizens with privacy protection against federal, state, local and commercial data banks.

Among the bills being considered are S 3418 and S 3633, both introduced by Ervin and sponsored by a bipartisan group of other senators including Barry Goldwater (R-Ariz.), Edward Kennedy (D-Mass.), Birch Bayh (D-Ind.) and Charles Mac Mathias (R-Md.).

Hearings are being conducted by an ad hoc privacy subcommittee of the Government Operations and the Constitutional Rights subcommittees.

Easy Access

Ervin said his study revealed 86% of federal data banks are computerized, and "while technology itself is not to blame for the encroachment on individual privacy, technological advances have made it possible for more institutions to gather, store and use more information about all of us."

Ervin charged some agencies have records with sensitive information on race, drug addiction history and salary, "but do not regard this as personal information."

Ervin said although most of the 54 agencies replying to his survey tried conscientiously to help the subcommittee's work, many agencies replied slowly or only partially.

"Some agencies like the Department of the Interior failed to answer the survey at all. Others omitted significant data banks or, like the General Services Administration (GSA), failed to report important new data banks plans [Fednet]."

Ervin reported 29 data banks are concerned primarily with derogatory information, including agency black lists, "look-out files," intelligence and civil disturbance files kept by such agencies as the Departments of Agriculture, Justice, Defense, Treasury and Housing and Urban Development, as well as the Small Business Administration and GSA.

"Most are created under general housekeeping authority or as a means of assisting authorized programs," he said. "Only 10% are specifically authorized by statute."

Other findings included:

- Forty percent do not tell citizens records are kept on them.
- Fifty percent do not allow subjects to review or correct their files.
- Some who allow file review do not inform citizens that files are kept on them.
- Sixty percent of data banks are regularly shared with other agencies, and a small number – 10 systems – allow reg-

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Two Clearinghouses Go On-Line; National EFTS a Step Closer

By Don Leavitt
Of the CW Staff

The possibility of a national electronic funds transfer system (EFTS) comes closer to reality next week with the opening of two more automated clearinghouses (ACH) to handle "paperless entries" instead of checks.

As of July 1, the New England Automated Clearing House Association (Neach) – based in Boston – and the Upper Midwest Automated Clearing House Association, Inc. (Umacha) – based in Minneapolis-St. Paul – will bring to their respective areas EFTS functions similar to those already up and running in California and Georgia.

Conventional clearinghouses are organizations through which checks and other financial "instruments" drawn on one bank but "cashed" at another are routed back to the original bank.

EFTS functions now include support for automatic deposit of payroll checks on the one hand and automatic preauthorized payment of fixed monthly debts – mortgage or car loans, or insurance premiums for example – on the other.

Neach also plans to offer bill check capabilities, based on a Georgia concept under which participating companies will print an authorization blank on their bills. Participating bank customers can fill in the amount they wish to pay on account, sign the authorization slip and mail the bill back to the company that issued it in the first place. This signed authorization is then processed as if it were a conventional check, a Neach source noted.

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CW Special Report on Banking Follows Page 30

CW Taps Bride, Phelan, Lundell

NEWTON, Mass. – Two new vice-presidents and a new editor have been named at *Computerworld*, publisher Patrick J. McGovern announced last week.

Margaret Phelan and Edward J. Bride have been elected vice-presidents, and E. Drake Lundell Jr. has been promoted to editor.

At the same time, McGovern announced several new additions to the newspaper staff and promoted Ronald A. Frank to an associate editor's slot in order to increase CW's emphasis on technical news.

Phelan was appointed vice-president/circulation, with responsibility for all aspects of the paper's 64,000-plus all-paid circulation. She has been with the paper

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But Main Thrust Is Control

Privacy Bills Differ in Scope, Enforcement Procedures

By Nancy French
and E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – The two data bank privacy bills now up for debate in the Senate are a synthesis of past studies and recommendations and differ mainly in scope and enforcement rather than basic principles.

The first of the measures (S 3418) is the broader of the two and would cover all data banks, public or private, whereas S 3633 would be limited to governmental files on personal information.

In addition, the first measure would require anyone maintaining a data bank of personal information to notify the individuals involved yearly that their names and records are being maintained, while the second measure would only require notification if the government agency was corresponding with the individual anyway.

The first bill would also give greater emphasis to a Federal Privacy Board for overseeing the provisions of the act, even though they both call for the establishment of such a board.

Basic Premises Similar

In outlining basic principles, both bills follow to a large degree the lead of the recent HEW advisory committee on automated personal data systems.

For example, they both call for banning any information systems with personal information whose existence is secret.

Second, the bills would prohibit the collection of any personal information without the establishment – in advance – of a need for such information on the part of the using organization or agency.

tems, the bills state, should be "appropriate and relevant" to the purpose for which it is collected.

In addition, they would prohibit the collection of information by either "fraudulent or unfair" means and would prohibit the use of any information that was not "accurate and current."

Furthermore, the bills state there should be procedures available for an individual to learn the information stored about him, the purpose for which it was collected and the procedure for correcting or amending the information on file.

Organizations holding any information would be faced with the burden of ensuring its reliability and of assuring that such information was not misused.

In addition, the bills call for "a clearly prescribed procedure" that would permit an individual to prohibit the use of any information about him from being used for purposes not related to the purposes of the original collection of that information.

The bills would also prohibit the Federal Government from collecting any information except as outlined by law.

Both bills contain fairly stiff penalties for violations of their provisions.

First, any organization or responsible officer of an organization who willfully keeps information without notifying the Federal Privacy Board or issues information in violation of the act would be liable to criminal penalties amounting to fines of not more than $10,000 for each instance and imprisonment for not more than five years.

Civil remedies would allow civil suits against offending organizations or individuals, with the penalty amounting to the actual damages involved and appropriate punitive damages, as well as court costs and attorneys' fees.

Both measures would establish a five-man Federal Privacy Board, but the emphasis under each bill is different.

Under the measure restricted to government agencies, the board would serve in the General Accounting Office (GAO) and would be appointed by the Comptroller General of the U.S. It would serve to keep Congress advised of the activities of federal agencies in meeting the requirements of the law.

Under the broader proposal, the board would be a full executive agency with its members appointed by the President with the advice and consent of the Senate. No more than three members would be permitted from any one political party and no government official could be appointed to the board.

While the bill regulating only government agencies is in many ways more limited, it does spell out administrative procedures that would have to be followed by such agencies in greater detail.

For example, any agency maintaining information systems containing information on individuals would be required to:

- Collect, maintain and use only personal information necessary to accomplish the proper purpose of the organization.
- Collect information to the greatest extent possible from the data subject directly.
- Establish categories for maintaining personal information to operate in conjunction with confidentiality requirements and access control.
- Maintain information in the system with accuracy, completeness, timeliness and pertinence as necessary to ensure fairness.
- Make no dissemination to another system without specifying requirements for security and the use of the information.
- Maintain a list of all persons with regular access to that information and a complete and accurate record of every access to the system.
- Collect no information on political or religious beliefs, affiliations or activities of data subjects.

858 Federal Data Banks 'Prove' Need for Strong Privacy Laws

(Continued from Page 1)

ular access by other agencies. These, Ervin said, are mostly law enforcement systems like the FBI's National Crime Information Center and the Department of Treasury's Treasury Enforcement Communication System (Tecs).

The Internal Revenue Service and the Selective Service "distribute information to other parts of the government despite pledges of confidentiality," Ervin said.

- Agencies that report the use of security measures to safeguard their data banks report "locked rooms" as the measure employed.
- Five percent replied they take no security precautions of any kind.
- Fifteen percent of the files use electronic security devices of varying degrees of sophistication. However, because even some of the more sophisticated and sensitive data banks such as Tecs have remote terminals, any unauthorized access or tapping into any one terminal will jeopardize the security of the entire data bank.
- Seventy percent of data banks are derived from existing files and records or use subjects to supply some data. Forty percent go to outside third parties.

Univac 90/30 Has Modular Operating System

(Continued from Page 1)

Other features bring this system price up to over $17,000/mo or over $535,000 purchase.

A micrologic expansion feature can expand the 84 basic instructions to 148, including 44 floating-point commands, and add four arithmetic registers.

Storage protection required on the larger configurations give write or read/write protection for programs and I/O in increments of 512 bytes for memory sizes under 128K and in increments of 1K bytes for larger memory sizes.

Multijobbing Feature

OS/3 multijobbing runs up to seven jobs concurrently. For greater efficiency, OS/3 provides multitasking so that programs can be constructed as a series of individual tasks which can be executed asynchronously, Univac said.

One of OS/3's main features is memory management allowing the system to avoid a rigid partitioned structure that can result in scheduling problems. Programs are not restricted to any section of memory and can be loaded dynamically for better utilization of memory, Univac said.

In cases where sufficient main memory cannot be made available to satisfy a request, OS/3 can roll out lower priority jobs to temporary storage. When sufficient main storage is again available, OS/3 reloads and restarts the rolled-out job at the point it was interruped.

Another benefit of OS/3 is the capability for determining a specific job's utilization of system facilities, Univac noted. This feature keeps track of CPU time, peripheral usage and the use of system features such as spooling, the firm added.

Spooling via OS/3 can increase throughput of the system by freeing jobs from slower input/output devices such as printers, card readers and punches. Use of disk storage to buffer input/output data allows these devices to operate at maximum speed. In addition, jobs requiring the same device can be run concurrently without tying up the system, Univac said.

OS/3 has been designed for predetection and management of system failures. It maintains a system monitor log to record any input/output failures during an operating session. If an unrecoverable error occurs, OS/3 lets the user restart from a check point to minimize rerun time.

Cobol, Fortran, Assembler and RPG II are available.

An integral part of the 90/30 is an interactive, transaction-oriented, proprietary data management system (IMS/90). It provides a technique to enable the user to retrieve and update data contained in his files.

A number of separately priced application programs are available for use with the 90/30 system. These include Management Control System (MCS), an advanced Pert system to assist in the planning and control of schedules and costs in a multiproject, multinetwork organization; Linear Programming; Unis Industrial Systems; Profits, a package for financial institutions; Upacs, a hospital accounting package; and Newscomp, a newspaper production system.

Users will be able to benchmark their programs starting in November, according to Univac. The system will be demonstrated at the Data Processing Management Association show this week in Minneapolis. Deliveries are slated to begin in the first quarter of 1975.

Barbecued Bytes

In an effort to reduce meat shrinkage during roasting, researchers at the U.S. Army Natick Laboratories in Natick, Mass., first simulated a roasting beef on a Univac 1106. Here Dr. Robert V. Decareau, Army food technologist loads roasts into a specially built oven controlled by an IBM card reader and program decks generated on the 1106.

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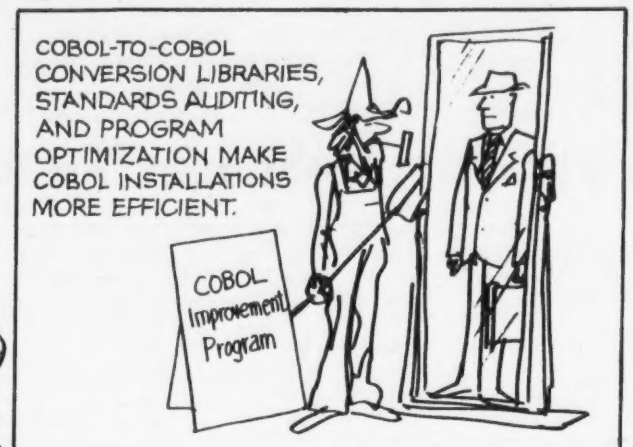
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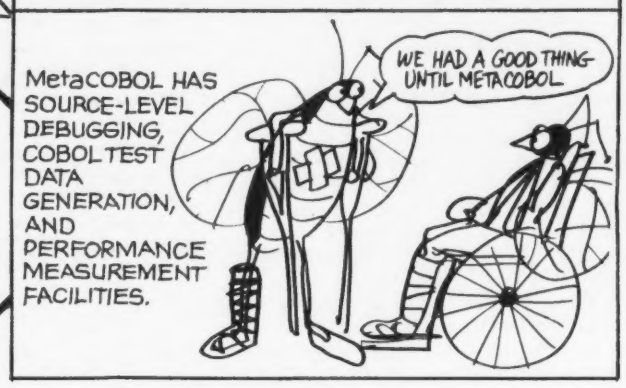
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Structured Programming Automated For Cobol Installations

PRINCETON, N.J.—New MetaCOBOL facilities are oriented specifically to Structured Programming—an important new technique for organizing and implementing large-scale software projects.

Structured Programming is gaining acceptance as a means of improving the quality of the code, improving project control, reducing the debugging phase of the project, forcing good software documentation as an integral part of system design, and making programs less sensitive to turnover of project personnel.

The essence of Structured Programming is modular organization, with the enforcement of certain standards for the structure of modules and for creating the links between them, using a limited set of special structural and linking statements.

In addition to these enhancements, Structured Programming requires that the use of certain Cobol verbs be restricted and that the facilities of other existing Cobol statements be enhanced. MetaCOBOL becomes a powerful tool to implement the disciplines of Structured Programming at minimum cost. The new facilities consist of a module format, to allow modules to be created and entered, and four special statements (macros) with which structures and links between modules are created.

The technique also allows data to be modularized. That is, data used by a module can be defined locally within the module.

The module format allows the programmer to identify and describe each module, define its data and working storage requirements in a concise and non-redundant form, and enter its procedures and conditional linkages. From these entries MetaCOBOL generates standard Cobol, with the proper material entered in each Cobol division.

This eliminates all the repetitive coding which would otherwise be required to develop Structured Program modules, and it automatically enforces the module-structure requirements of the method.

Structured Programming is not suitable for all users, ADR noted, so the company is neither advocating nor endorsing its use on a widespread basis, though supporting its ultimate goals.

For Cobol installations which decide to adopt the discipline, MetaCOBOL is the ideal vehicle for Structured Programming statements.

The new Structured Programming facilities are available immediately.

Immediate Economic Benefits Available to COBOL Installations With MetaCOBOL Libraries

PRINCETON, N.J.—Libraries of specialized functions, distributed to all MetaCOBOL users, are bringing immediate benefits to COBOL installations. These libraries (seven in all), which can be customized by the users themselves, are divided into two groups—The Program Development Library and The COBOL Utility Library. The Program Development Library contains abbreviations and extensions of the COBOL language to reduce program development cost and effort, while significantly raising the level of program clarity and maintainability. The COBOL Utility Library contains functions which are applied to existing COBOL programs for analysis, modification, and standardization of the source code.

The COBOL Utility Library consists of:

Standards Auditing, which diagnoses common programming standards violations in COBOL source and produces standards summary reports. This function is a necessity for internal standards enforcement and a valuable technique for reducing maintenance costs.

Source Program Optimization, which highlights inefficient statements and data usage in COBOL source code and summarizes results. This procedure is valuable not only for COBOL optimization, but for COBOL programmer training as well.

COBOL-to-COBOL Conversion, which translates IBM Levels D, E, and F, RCA Spectra and Honeywell H-200 to IBM DOS or OS American National Standard COBOL. MetaCOBOL allows for new features of compilers and operating systems so that your conversion will result in the efficiency you're seeking.

Special Utilities, which perform automatic level and paragraph numbering, mapping of record descriptions, and many other functions. These utility functions relieve the programmer of concern for many required standards and documents during program development, and can be reapplied following program maintenance.

The Program Development Library consists of:

Short Forms, which can replace the full COBOL text they represent to reduce coding labor by 30-60%. ADR- and user-supplied short forms can be used for required COBOL words and phrases, for frequently-written Data- and Procedure-names, for name prefix expansion, and for redundant logical statements.

New Verbs, which can be written in place of redundant and often complex COBOL functions. Like standard COBOL verbs, MetaCOBOL verbs can accept any number of variables and can therefore generate optimum, data-dependent COBOL statements, work areas, and subroutines.

Major Logic Generators, which use interrelated sets of verbs to define major logical elements of a COBOL program such as report writing, file match/merge, input validation, and, most important for today's technology, data-base interfaces.

MetaCOBOL is available under monthly or permanent license. For additional information on the MetaCOBOL Libraries, contact Applied Data Research.

Mini Reduces Floats on Non-Interest-Bearing Funds

CHICAGO – A minicomputer is being used here to help reduce floats of non-interest-bearing funds for the lock box customers of the First National Bank of Chicago.

On-line to a data base and collection service in Atlanta, the mini enables the bank to write depository transfer checks daily to transfer client cash deposits from remote banks to home office bank accounts, a First National Bank spokesman said.

As a result, midnight cash deposits of a client's fast food outlet in Las Vegas, for example, will be credited to its home office, or concentrator account, in Chicago the next morning, he explained.

In addition to speeding the crediting of cash receipts, the bank's use of the Varian Data Machines V73 mini discourages inefficient use of its large-scale computers, the spokesman said.

"Prior to the V73, we listed tape-received deposit transaction data on a printer and reentered it manually to write depository transfer checks," he continued. The alternative to acquiring a mini was to tie deposit transaction data to a larger system for automatic check writing. But this proved uneconomical, according to the spokesman.

He described the bank's mini as an "electronic assist for those applications not appropriate for our IBM System 370 and 360.

"We get a job on the V73 in 10 minutes, in contrast with waiting an hour or more for one of the larger systems," he said.

The lock box procedure begins with a call from a client's remote outlet to one of several regional communications centers immediately after the deposit of a day's cash receipts. The caller identifies himself with a seven-digit composite code representing company and store number and advises a special operator of his deposit amount, the spokesman said.

After the phone input is verified, the information is transmitted via CRT to a data base and collection service located in Atlanta. There, after several checks on the validity of the information, the deposited data is stored on disk pending acknowledgment before noon the following day.

The files of a previous day's deposit transactions are sent to the First National Bank of Chicago and written on a tape drive. The match of a four-digit store code with a disk file data base calls out the store's local bank ABA account number, name and address of the local bank and other pertinent data, explained the spokesman.

A data record tape is then created and used as input to a Micr imprinter for producing the depository transfer checks. Funds are credited to client's concentrator account in one third of the time required before the use of the mini, he concluded.

Two Clearinghouses Ready for Operation

(Continued from Page 1)

Bill check is actually an extension of the basic ACH concept, and Umacha president Charles Arnar, senior vice-president of the First National Bank of St. Paul, was unable to say whether any participating companies in his area will be using anything like bill check. Implementation of such an operation, he explained, is a business arrangement between a bank and its customers and does not directly involve the clearinghouse.

The ACH operation is based on processing on standardly defined magnetic tape records documenting the desired movements of funds between one bank and another, and by extension, between one customer's account and another. Though many banks have DP facilities in-house or available to them through service bureaus, even nonautomated banks are encouraged to use ACH facilities, Arnar said.

As long as the bank's entries to the system can be put on magnetic tape, they can be handled. Even when distance precludes physical delivery of the tape to the ACH, images of it can be transmitted over data lines and the substance of reports can be returned at the end of processing. In that way, banking regulations requiring entry of all items before the start of the next business day can be honored, Arnar said.

California led the nation in the move to ACH in 1972, with the urging and blessing of the American Bankers Association Monetary and Payments System (Maps) planning committee and the Federal Reserve System.

In April 1968, the Special Committee on Paperless Entries (Scope), authorized by the Los Angeles and San Francisco clearinghouse associations, started studying, developing and recommending standards and procedures for exchanging preauthorized paperless entries among banks. After four and a half years of preparation the California ACH began operation on Oct. 6, 1972.

Concurrently, the Federal Reserve Bank of Atlanta began studying paperless entry systems in 1969 and helped form the Atlanta Committee on Paperless Entries (Cope) in June 1971. By August 1972, Cope acquired the California ACH software and by May 1973, the Georgia ACH began operation.

There is no immediate plan to link the four ACHs, and that is the way it should be, according to both Arnar of Umacha and Don McGowan, executive director of Neach. There are enough problems in managing ACH operations on a regional basis, so there is no rush to face the prospect of one region's problems impacting another region's operations.

By staying separate, for example, Neach is able to work with various financial institutions that are excluded from the earlier ACHs. Umacha for its part, has distances to contend with that are unlike those of the other operations. Limited for now to Minnesota, the Dakotas and parts of Wisconsin and Michigan, Umacha "should" ultimately include Montana if it is to serve the entire Ninth Federal Reserve District as expected. But Butte, Mont., is 1,100 miles from Minneapolis-St. Paul "and that's as far as from Minneapolis to New York," Arnar noted.

Computerworld Promotes Phelan, Bride, Lundell

(Continued from Page 1)

for over six years, having joined the publication as circulation manager.

As vice-president/editorial services, Bride will be responsible for the Computer Users' Forum at the Computer Caravan, the traveling regional trade show sponsored by the paper, and the EDP Seminar Series, which offers user-oriented seminars in data processing.

Bride, who will also be responsible for exploring new editorial projects for CW, joined the paper as a reporter in 1969 and most recently served as editor. He is coauthor of *Computer Use: An Executive's Guide*, published by Allyn and Bacon.

Margaret Phelan

Edward J. Bride

E. Drake Lundell Jr.

CW Photos by Leslie Flanagan

Ronald A. Frank

Day-to-Day Chief

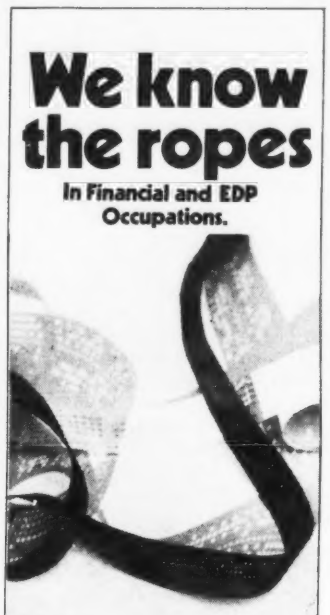
Lundell moves up to the editor's slot from his position as associate editor/general news and computer industry and will now be in charge of all day-to-day operations for the paper.

Lundell, who has also served in the CW Washington, D.C., news bureau, will continue the paper's tradition of aggressive, user-oriented reporting which has earned important awards for the paper, including the Jesse H. Neal award for outstanding journalism presented by the American Business Press.

Lundell is coauthor of *Computer Use: An Executive's Guide*.

As associate editor/technical news, Frank will have the responsibility of expanding the newspaper's coverage of all technical aspects of computer use. He will continue to edit the data communications section of the paper in addition to the new responsibilities.

In other moves, Judith Kramer has been promoted to the post of chief copy editor; Nancy French has joined the staff as a staff writer in the general news department; and Jesse R. Victor was added to the staff as a copy editor.



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Car Crash Simulations Steer Manufacturers to Safety

By Joseph Hanlon
Special to Computerworld

LONDON – Safety tests for automobiles used in the U.S. as prescribed by the Department of Transportation require the actual destruction of the cars. But this method can be quite expensive, so auto manufacturers are turning increasingly to computer simulation for initial studies and tests.

At the Fifth International Technical Conference on Experimental Safety Vehicles here this month, most of the major manufacturers presented papers which included the use of such computer-based studies.

British Leyland, for example, has computer models to simulate the effect on the car of front, side and rear impacts. According to Leyland engineers W.C. Emmerson and J.E. Fowler, who gave a paper at the meeting, 52 different front-end structural design schemes were considered with the computer before the final one was actually built and crashed.

Set of Masses

The standard vehicle deformation modeling technique described at the meeting by British Leyland, Nissan of Japan and others, is to consider the car body (and occupants) as a set of masses connected by nonlinear springs. Each part of the car, such as the motor, the passenger compartment, the passengers themselves, the bumper, the front suspension and so on are considered separately.

Experiments are conducted to test the stiffness of various components and thus to give values to the "springs" in the computer model.

The Nissan model is typical, with 10 masses linked by 19 springs. Output of the models can be forces on the passengers or on parts of the car itself, and thus can study both passenger survival and car damage.

British Leyland has found "very good correlation" between the predictions of the model and actual test crash data. Using the model, Leyland engineers experimented with various front-end modifications and chose, for example, among three possible front bumper systems.

The models are also helpful for studying what actually happens in a crash. The Leyland model showed that in a side impact, the side structures must be treated separately from the rest of the car body because they move at considerably different speeds during the impact.

Dummy Family

Other computer models simulate just what happens to people involved in car accidents. Vauxhall Motors Ltd. has an extensive test program involving a family of 15 dummies and has developed computer models to go with them.

The Vauxhall model simulates the two-dimensional motion of a dummy by numerically integrating the dummy accelerations with respect to time. The dummy is represented by eight segments jointed together. Each segment has a mass and rotational inertia; joint stiffness and movement limits are included.

Various seat, seat belt and interior configurations can be used, and the program prints out forces, accelerations, injury criteria, etc., and also plots drawings of dummy movement.

Yet another computer model was described by Alpha Romeo of Italy. Its model studies the effects of steering and braking while going around a curve.

The conference was sponsored by the U.S. Department of Transportation as part of its international program to make cars safer.

Program Omission Causes $248,000 Error

CW West Coast Bureau

LOS ANGELES – An incorrectly programmed computer has resulted in refunds totaling over $248,000, by Chrysler Credit Corp.

The refunds were issued after a complaint was made here to the Los Angeles Bureau of Consumer Affairs about a miscalculated $4.12 rebate of finance charges to a car buyer who paid off an automobile loan early. The refunds should have averaged an additional $15 per person.

A spokesman for the auto financing firm, a subsidiary of Chrysler Corp., attributed the "miscalculated rebates" to a computer error regarding customers who prepaid their accounts.

Section Left Out

In programming the computer, a spokesman said, one section of a state law governing motor vehicle financing was inadvertently omitted from the program.

"The oversight meant some customers were not paid an additional one month's finance charge" allowed under the state Rees-Levering Act.

A Chrysler Credit spokesman said the company voluntarily began a refunding program in March, when the error was first brought to its attention by the Bureau of Consumer Affairs.

Aussies 'See' Election Returns

CANBERRA, Australia – In the closest election ever fought in Australia, computers played a major role in bringing latest polling results before the public.

Under Australia's compulsory voting system, which is also preferential, computers used by four television channels in Melbourne and four channels in Sydney were able to flash immediate voting trends to the public.

Viewers criticized certain aspects of computer displays which were not relayed long enough on TV screens for people at home to read and understand.

Viewers also said preferential trends were programmed on voting up to that point, and took no account of where the polling booth was located.

They also said computer displays were often too small for people to read on their home TV screens. They did not come up big enough and bright enough, viewers said.

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Hardware, Program Problems Smoothed

Traffic System Survives Troublesome Initiation

ST. PAUL, Minn. – A computer-regulated traffic control system, designed to smooth rush-hour traffic, has survived initial snarls at access ramps on a major freeway here.

Established two months ago, the I-35W Urban Corridor Demonstration Project has ironed out hardware problems experienced with its Honeywell 1603 and straightened out program difficulties encountered the first two days of operation, according to project head Glen Carlson, assistant traffic engineer with the Minnesota Highway Department.

The $5.9 million system, installed at 32 ramps on I-35W and activated by 320 sensors embedded in the pavement, received considerable criticism at first, Carlson said. He indicated motorists' unfamiliarity with the system accounted for the difficulty at two major ramps.

When a motorist drives onto an entrance ramp, he encounters a traffic signal similar to those at intersections. Initial problems occurred when drivers didn't pull up close enough to sensors measuring traffic volume to key the signal, Carlson explained.

Initial ramp meter rates were too long, Carlson added, which meant the system wasn't allowing vehicles to enter the freeway quickly enough.

The metering rate at the two ramps has been changed, and signs directing motorists to drive closer to the signal had been installed before the first day's evening rush began, he said.

Over the last few weeks, an improved flow of freeway traffic has resulted from data received from the system's computer, comments made by motorists and constant scanning of the highway with the system's closed-circuit television cameras, which monitor the entire 18-mile stretch of the freeway, Carlson commented.

"The public is very receptive to this means of controlling traffic," he said. "We've received virtually no complaints since we corrected the problems of that first week."

Buses have priority access to the freeway, and one goal of this experimental system is to convert 15% of the rush-hour drivers to bus riders, Carlson noted. Other project goals include maintaining a 35-mile-an-hour speed in all bottleneck areas during peak traffic periods, reducing rush-hour accidents by 20% and limiting the time it takes to clear them.

The highway department is studying the entire urban freeway network and "results from the work on I-35W will determine the use of this traffic control system elsewhere in St. Paul," Carlson said.

He noted similar systems have gone into operation on freeway networks in Los Angeles, Houston, Dallas, Chicago, Detroit and New York.

A $3,000 Showcase

COLUMBUS, Ohio – City fathers are so proud of their soon-to-be operational computerized traffic light system, they decided to display the computers that run it behind show windows on the first floor of the City Hall Annex.

The complex, which consists of four computers and seven television monitors, cost the city $200,000 and controls the entire $2.4 million downtown traffic light system.

The only problem was that some city officials were concerned that a brick or a bullet through the window could damage a computer, creating havoc on downtown streets.

The solution: bullet-proof glass, costing taxpayers about $3,000.

Small System Aids Geriatric Research

LOS ANGELES – A computer system is helping scientists at the University of Southern California (USC) here investigate the processes and problems associated with human aging.

The computer-aided research, under way at USC's Ethel Percy Andrus Gerontology Center, embraces subjects such as biochemical and behavioral changes that accompany aging, analysis of government policies regarding the aged and the design of buildings and parks to meet special needs of older persons.

Independent of USC's central computing facilities, a Varian 73 system was installed through a grant from the Department of Health, Education and Welfare, Administration on Aging.

Garst Reese, chief of the center's information systems laboratory, pointed out that a major bottleneck in social science research is the time-consuming digesting and keypunching of information from surveys, questionnaires and interviews so that it can be handled by a computer.

With the Varian 73 system, Reese and his colleagues plan to develop programs that will allow a researcher or interviewee to enter data directly into the system by filling in the blank fields in a questionnaire that will be displayed on a CRT terminal.

Their goal is interactive programs that will review data as they are entered, and immediately point out any entries that are improperly placed or factually impossible.

In biological research, the system will help researchers assemble and use bibliographies and even help authors prepare scientific papers. The system will also allow a researcher to build and retrieve his own bibliography for a particular project, according to his own rules.

Other elements in the center's system include analog-to-digital and digital-to-analog converters, four CRT terminals and four hard-copy terminals, magnetic tape units and disk storage.

NAS to Study Large Systems

WASHINGTON, D.C. – The National Academy of Sciences has formed a new commission responsible for programs dealing with large-scale technological systems that provide goods and services to the public.

The Commission on Sociotechnical Systems will study specifically the opportunities and social consequences created by these technological systems and their interactions with one another.

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D&B to Expunge 'Nonconvictions' From Credit Record in 6 Months

NEW YORK – Dun and Bradstreet (D&B), one of the nation's largest computer-based credit reporting agencies for business, has instituted a change in reporting criminal proceedings that exceed minimums set by the Fair Credit Reporting Act.

Under the new policy, information concerning criminal proceedings that result in a nonconviction will remain on a businessman's record a maximum of six months, a reduction from D&B's previous three- or four-year standard, and the Fair Credit Reporting Act's seven-year standard.

Clarifying the change, D&B's vice-president and secretary Harold T. Redding said, "Even if you are wrongly accused of something and have to spend a lot of money defending yourself, you still must be a weaker credit risk. It may be unfair, but nevertheless, it is an impact on your credit position.

"We're trying to balance the needs o our subscribers with the social implications as far as the individual businessman is concerned, and we think the six-month period is a fair one," he said.

The new policy states that information concerning a grand jury indictment or other criminal proceeding "shall be reported until concluded by a conviction, dismissal, acquittal or a notation that no further prosecution is intended."

When the proceeding has been concluded with a nonconviction, the information describing that conclusion will be reported in a D&B special notice. In these cases, the report shall be revised immediately, and no further mention made of the criminal proceedings in the complete revision, successor report or original reports which follow with routine updating.

Business Reports Go On-Line

NEW YORK – Dun and Bradstreet's (D&B) Business Information Reports are now being produced in the company's 75 local offices by means of computer terminals tied into a national computer center in Berkeley Heights, N.J.

D&B calls this conversion to a computerized system "the most significant technological advance in the company's history," according to Joseph Caravella, editor of *D&B Reports*, the company's subscriber newsletter.

In coming months Caravella said two additional functions will be added to those now performed by the computer.

"The first will allow the transmission of teletypewriter messages via the CRT units. The second will enable the computer in each office to electronically transmit Business Information Report data to the Berkeley Heights computer center," he explained.

Once operational, the Berkeley Heights center will be capable of transmitting data from any Business Information Report on file to any D&B office in the country requesting the data, making reports available from a single source. This move will eliminate the current "massive message interchange between D&B offices," Caravella said.

Quotron minicomputers with desktop CRTs in local offices will access a Xerox Sigma 5-S and a Sigma 9-S at the New Jersey center.

Government DP Study Launched

IRVINE, Calif. – Researchers at the University of California here are launching a $418,000 study to determine if the use of computer-based information systems has resulted in "shifting the power center" in local governments.

Funded by the National Science Foundation, the university's Public Policy Research Organization (PPRO) will examine the impact of information systems on cities and counties – a segment of government whose annual nationwide DP spending has increased from $50,000 to over $1 billion in 15 years, according to John King, PPRO research associate.

Phase one will ascertain the state of the art in cities and counties with populations of 10,000 or greater. "This will involve sending questionnaires to persons with key job titles in about 900 cities and counties throughout the U.S.," King explained.

The phase one questionnaire will yield data for a nationwide directory of local government data processing departments, equipment and personnel.

Personal Visits

Phase two will involve personal visits by researchers to about 40 key cities, selected on the basis of applications, number of services involved and complexity of the system in question.

The research teams will gather information to help determine the relationship between policies and the outcome of policies in each municipality.

For phase three, 10 municipalities will be selected for "in-depth, longitudinal analysis to determine the relationship between policy, outcome of policies and the particular environment that exists," King said.

Phase three has not yet been funded, he added.

County FM Plan Lauded

SANTA ANA, Calif. – Orange County, Calif. has received an achievement award from the National Association of Counties for its program to increase the cost-effectiveness of its computer operations by contracting out for facilities management.

The contract, awarded to Computer Sciences Corp., is said to be the first of its kind in county government, and is expected to save the county $11 million over the next seven years.

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Project Trains Handicapped for Programming Jobs

LYNCHBURG, Va. – Though homebound by his wheelchair, Douglas Boyce works full time as a computer programmer here, as a result of a project designed to prepare the homebound handicapped for careers as computer programmers and terminal operators.

The project . . . [is] an effort to gainfully employ more of the two million homebound disabled in the U.S. . . . Only 12,000 of these are successfully employed today.

The project, sponsored by the Virginia Department of Vocational Rehabilitation (DVR), receives financial support from the Federal Rehabilitation Services Administration, in an effort to gainfully employ more of the two million homebound disabled in the U.S. – those persons prevented through disability from traveling to a job. Only 12,000 of these are successfully employed today, according to a DVR spokesman.

Contracts GE

Boyce, a quadriplegic as a result of a high school wrestling accident, contracts with General Electric's Communication Systems Division for data information assignments.

Through a Terminet 300 data communications printer equipped with an acoustic coupler and cassette tape, Boyce completes the logic design, writes the Cobol code and enters it into the cassette tape. Then it is transmitted via the Terminet to GE's Honeywell 6000 system, designed for remote processing.

When the program is fully operational, Boyce directs the output to the computer site for pickup.

Boyce received his job after completing high school in a hospital and continuing on through an associate degree program and vocational rehabilitation.

Job Commitment Needed

Because a trainee is accepted into the program only when DVR has obtained a job commitment, Virginia's "Homebound Handicapped in the Computer Industry" effort is dependent on the interest and cooperation of companies like GE, a DVR department spokesman said.

Carefully screened candidates for the program receive their initial training and continuing therapy at the Woodrow Wilson Rehabilitation Center (WWRC), Fishersville, Va.

Two basic curricula have been established at WWRC:

- An eight- to 12-month course for computer programmer includes training in computer concepts, Cobol programming and practical work tailored to the job.
- A one- to four-month program for computer terminal operator involves work in terminal operation in addition to practical work related to the job.

Trainees in both programs should have ability or potential to perform at about a high school graduate level, according to a DVR spokesman.

Information about the DVR's ongoing project for the homebound handicapped can be obtained from John Lucado, Department of Vocational Rehabilitation, 500 Alleghany Ave., Lynchburg, Va. 24501.

Football Hit Charts A Hit With Players

BUCKHANNON, W. Va. – Visual hit charts which players can easily understand are the major feature of a computerized football scouting system operated by West Virginia Wesleyan College, according to L.D. Montgomery, DP director.

Pictorially showing holes in the line and passing zones, the hit charts list offensive plays run at each hole and zone, broken down by five game situations: offensive formation, down and distance, hash mark location, field zone, and plays from 10 yards and closer to the goal line.

"It's not so much the coaches who need scouting information but the players," Montgomery said. "They're the ones who have to realize what to do."

According to Montgomery, other scouting reports run on the college's NCR Century 101 computer system include a play sequence report and a summary of play frequency by formation.

Game Films Used

Game films are used to fill out a scouting form which takes about one hour to complete per film. Twenty-three different types of data ranging from formation and field position to pass route and receiver are filled out on the form.

The data is keypunched into cards which are entered in the computer to produce the scouting reports in 45 minutes every Sunday. Additional reports and analyses are produced at a coach request.

"We tape the hit charts on the walls of the room where the players prepare for practice," Montgomery said. "The kids can look at the charts and quickly see what kinds of plays are going to be directed at their positions under what kinds of game situations."

TI announces four new computer products

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Human Error Pollutes Computer

GALVESTON, Texas – "Due to a computer error . . . " Galveston County became this state's only area to be designated as a potential violator of the federal air quality standards due to an unusually high content of sulfur dioxide.

Since the area is not generally thought of as heavily industrialized, it occurred to some that "the computer" had erred.

After some research into the problem, it was discovered that a mistake occurred in figuring the annual average level of sulfur dioxide in Texas City. Apparently, a keypunch operator recorded the number of air samples taken there as "3," rather than the actual number taken, which was "13."

This yielded an incorrect average of 228 micrograms of sulfur dioxide (the federal limit is 80), when it was actually only 53 micrograms for each of 13 samples.

Galveston County has since been "dedesignated."

Private Use of County System Charged

By Edie Holmes
Of the CW Staff

FORT COLLINS, Colo. – A former Larimer County commissioner and current director of the county's data services was arraigned here June 12 on charges he used the county computer for private business.

William Manuel, who was a county commissioner until March 1 when he left that post to seek the position as head of the data services department, said he received $3,500 while he was a county commissioner for extra work he did for the city of Fort Collins.

Manuel didn't specifically tell the commissioners he had a project with the city that his company, Larimer County Data Services, was going to carry out, said commissioner William Lopez.

"Manuel actually opened up a consulting business using the county's computer, portable terminals and staff," Lopez added. "He was working with the computer when he should have been acting as county commissioner."

City Paid for Time

Manuel claimed the city had paid the county for the computer time; that the city owns 20% of the Decsystem-10 and pays the county $2,400 a month for its use. He maintained he formed a private firm to do extra jobs for the city because the county employees had been working overtime to get these jobs done without compensation for extra hours.

Lopez said he and the other county commissioners "aren't sure how we feel about the case." The district attorney brought suit against Manuel independently of the county commissioners, though initially they asked him to look into the case.

Although they haven't taken direct action concerning Manuel, the commissioners do plan to hire an administrator to oversee the county's DP operations. Such an administrator may be given authority "to formulate and institute acceptable procedures and controls that will minimize the possibility of questionable practices in any department," commissioner Warren Wolaver said.

No Computer Background

While he doesn't have a background in computer science, Manuel said he became interested in the county computer when he was a commissioner. He took some courses in data processing at Colorado State University, but characterized most of his experience as "practical."

In a written statement, Manuel said he had put in many hours working with the computer while he was a commissioner.

Charged with a second degree misdemeanor, Manual will come before the Larimer County Court sometime in late June or early July.

Mobile Computer Planned

Special to Computerworld

SYDNEY, Australia – Cheap mobile computers designed for the classroom will be available in two years for use in Australian high schools, according to Dr. C.J. Bellamy, the director of the computer center at Melbourne's Monash University, and L.G. Whitehouse, a senior lecturer at the center.

In a paper delivered at the sixth Australian Computer Conference, the two described a Monash computer center project called the Educational Computing System (ECS), which they said has lowered the cost of a classroom computer from $22,000 to $7,500.

The ECS will be silent and could be wheeled into a classroom where it could handle up to 400 student projects in one hour, they claimed.

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Editorials

User Group Debate Needed

There has been too little comment on the proposal for a computer users organization as outlined by the Computer Industry Association during the 1974 National Computer Conference.

No one to our knowledge has debated the proposal seriously; not the American Federation of Information Processing Societies, not the Data Processing Management Association and not the Computer and Business Equipment Manufacturers Association – all of which would have been likely candidates to finance the new organization along with the CIA.

Perhaps the timing of the proposal was wrong and the news of the proposition was buried in the glut of material from the NCC. But it shouldn't go unheeded entirely.

The idea is a good one, although the specifics still need to be worked out.

Debate on the subject should take place, regardless of whether such an association is ever formed, because such a debate would tend to focus on the real needs of computer users.

This debate – and voice of the user – has been lacking too long in the computer community and should be encouraged.

Computerworld can clearly play a role in getting such a debate started and takes this opportunity to invite all users to comment on the CIA proposal for a computer users group, whether pro or con.

You, the computer user, would obviously be most affected by the proposed organization and we welcome your comments on whether such an organization is needed, what role it could serve and how it should be organized.

Don't Give Up

A bill defining citizens' rights to privacy in relation to government data bank systems is now before the Senate with strong bipartisan backing.

Although the bill is limited to government data banks, it should be supported by everyone concerned with individual privacy.

Government violations of individual rights are perhaps more serious than private violations or at least the potential for abuse is larger.

Therefore, this new bill supported by Senators Sam J. Ervin Jr., Barry Goldwater, Edward Kennedy, Birch Bayh and Charles Mac Mathias is welcome and needed – and should not be shunted aside in Watergate-tormented Washington.

But this bill alone will not do the job. Civil libertarians should not give up the fight for strong safeguards on computerized data banks just because one of the worst offenses is close to a cure.

Further legislation will be needed to control data banks in the private sector and soon we will have to begin taking a hard look at how the very collection of personal information can be curbed.

'Before Ordering a Second Computer, Have You Considered Using the One You Already Have?'

Letters to the Editor

Programs Halts Due to Errors Poorly Handled by IBM's OS

Many of *Computerworld*'s readers use IBM's OS which suffers from a defect: it has a poorly designed method of terminating a program due to an error.

Whenever it becomes necessary to terminate a program due to an error, the amount of the dump does not depend on the type of error but rather on the name used to reference the file which will contain the output. The name chosen will result in either a dump of the operating system and the user program, or just the user program alone.

This causes two problems. The first option results in more output than is usually needed, wasting paper and machine resources. The second option may result in insufficient output for a given error and thus require the job to be rerun, although it is sometimes impossible to duplicate previous events.

I believe this defect in the operating system can be corrected by allowing the routine that terminates a program to determine the extent of the dump, whenever the second option was chosen. I wonder just what your other readers will have to say.

R.A. Sobieraj

Perth Amboy, N.J.

Models That Prove the Unprovable Give DP Profession a Bad Name

In reference to the June 12 article entitled "Computer Collecting Data on Effects of Nuclear Plants": It is important to point out that the massive amounts of meteorological data are collected before the plant goes into operation in order to create a mathematical model. This model is then used to predict the low-level radiation doses to people near the plant.

However, once the plant goes into operation, the inhabitants are treated to quarterly summaries of total release amounts. The Atomic Energy Commission does not require and the utilities do not volunteer to crank out predicted doses based on real-time weather and radwaste release data. The AEC says the model cannot be used in this manner.

This same strange logic of computer models which can't be checked out but are used to "prove" the safety of atomic power plants is evident in the emergency core cooling computer code. These programs were written to "prove" the operation of emergency cooling systems to be used in a physical operating environment for which there is little experimental data. Because of funding difficulties in building the "loss of fluid test" facilities, it was more expedient to "prove" the operation of the system by computer.

The gross abuse of the scientific method as perpetrated by the nuclear industry and the Atomic Energy Commission through the development of computer models to "prove" the unverifiable is certainly a black mark against our whole profession. Hopefully, development of safe alternative methods of generating electricity will be fruitful before a failure of one of these models leaves a glowing green mark in my neighborhood.

John Davenport
Vice-President

Ampersand Corp.
York, Pa.

Big Paper Orders Drive Prices Up

Re the article appearing in the May 22 issue entitled "Plagued by Paper Problem? Here's Help":

Sy Kramer of Revere Business Graphics, Inc. has suggested 10 "golden rules" for solving paper problems. Nine of them are great, but one will not solve the problem, it will create more!

He said ordering an 18-month supply rather than the customer 12 will assure the user a good supply and hedge against rising costs. If all users in the U.S. took this suggestion, the mills, which are having their problems just supplying normal annual supplies, would need 50% more mill capacity to ship everyone an 18-month supply in a 12-month period. Even if a few people take this suggestion, it will make demand exceed supply and drive prices up further, rather than reduce them!

The soundest approach is to order no more than a six-month supply. This will allow mill capacity to keep pace with demand, keeping prices stable. Four major paper manufacturers are currently upgrading their production capacities to meet rising demand.

If we all buy in moderation, many of the current price/supply problems will be reduced.

George C. Miller
District Sales Manager

Wallace Business Forms, Inc.
Houston, Texas

Put Printing on Both Sides

The spiraling cost of paper and the promised shortages have spotlighted the fact that the computer center printing industry is perhaps the only publishing industry of such magnitude that prints on only one side of the paper.

Billions of sheets of paper are printed one side only; we use 4 million sheets per year. Each day we wipe out a forest of pulp that represents the back, blank side of the paper that we cannot use. Hopefully that fact will shock the conservationists.

We fill bin after bin of unprinted paper; that should concern the environmentalists.

We spend millions of dollars and get nothing for the money spent: that should concern management.

We must ask the computer mainframers to provide us with a printer that prints both front and back of one-part paper simultaneously.

Leo F. Miernicke

Windsor, Ont.

Letters to the Editor

A Xoma Win Would Set Undesirable Precedent

Re "IBM Canada Sued in Patent Dispute" [CW, May 22]:

Every time I read about the Xoma patent I shudder to think about the consequences of Xoma Ltd. winning any of its cases, especially the one against IBM.

A precedent would certainly be set that would pave the way for other individuals to file patents for other types of business techniques used by many computer users today.

It seems to me that the Patent Office has taken an irresponsible step by issuing a patent to someone who is obviously attempting to exploit the private sector of the computer industry.

B.M. Turner
Vancouver, B.C.

Most Programmers Know What They Wrote

I must disagree with the statement by Richard Heiser in his article on Cobol algorithms: "... Cobol programs are too hard to understand, even with listings, explanations and flowcharts. Nobody can understand them, not even their authors" [CW, June 5].

To categorically state that no one can understand a Cobol program, not even the person who wrote it, is sheer nonsense. I submit this statement is not only unsupported by factual data, but that it is also false.

The majority of programmers I know understand what they wrote and why they wrote it. Perhaps I have only met competent programmers, or perhaps Heiser has only met incompetent ones.

At any rate, I feel the statement is derogatory to the professional competence of programmers and should be withdrawn.

Jerrold L. Dykstra
Evergreen Park, Ill.

Seed Sown Elsewhere

Re the May 29 article "Does Each Configuration Have a Natural Load?":

Dale Brotherton at General Tire & Rubber deserves credit for the original idea and its implementation at his installation. As with any basic idea in management science, many people must work with it before perfection and acceptance comes.

Donald C. Harder
Cleveland, Ohio

Seoul

When I was chairman of ICA, the Intergovernmental Council for ADP, we held a great meeting in Oslo, out beyond the Holmenkollen ski jump. At that meeting we had our first South Korean delegates, full of energy and curiosity but then claiming only six major computers in their government bureaus. Mr. Lee, who was Vice Minister of Science and Technology, asked me to visit Korea the next time I was in the Far East.

In a region of explosive growth and Westernization, Korea – or more precisely, Seoul – shook me to the core. First of all, it surprised me with its size: the capital has over *six million* inhabitants, and opens its new subway in late summer. Japanese equipment, so it will undoubtedly run (ah there, Bart!).

Then there was the matter of computer size and type. The 16 major centers now include 370/145, 1106 and Century 200 machines, and a big CDC shop at the Institute for Science and Technology (Kist) with Cyber 72 CPU, 65K core and 220M disk – and plans to go up to the 6600 level! Cobol, Extended Fortran, Simscript, Simula, and Algol 60 are available; Pert/Time and APT are in use; they have had remote real-time terminals running since 1972 and major remote batch at two centers for a year.

The reason for the big machines and the large, advanced staff is, of course, economic. Korea, in spite of wild expansion in manufacturing and service, still has great problems with imports and trade balances. So they decided, at least in government, to opt for a small number of large, powerful installations. Dr. Sung, who runs the Kist operation, complains that his trainees get siphoned off by commerce and industry, but says with a shrug that it's all good for the country as a whole. Familiar? Shades of the American aerospace days!

There is also a very large information service, looking ardently toward our Commerce NTIS operation. They are considering Medlars – I counseled waiting, in view of the enormous first step (remember the joke about the elevator shaft? It doesn't go well in Korean!) – and are already heavily involved with Chem Abstracts.

And, to get away from drab old data processing, I madly recommend the night club show at Walker Hill. The Korean parts are wonderful, and the girls are *magnificent*.

I had mostly Chinese food, with a steak dinner at Walker Hill. There is a pickled cabbage national dish called *kimchi*. Skip it!

Forms Design Successfully Keeps Some Items Secret

The computer applications and information systems courses at New York University Graduate School of Business Administration are going to have some new examples of forms design next year. Prof. Myron Uretsky proposes to severely punish students who produce computer output which is incomplete, even though it is probably acceptable by today's business standards and is, in fact, accurate.

The subject came up because of a computer-generated letter from the Greater New York Blue Shield operation rejecting a claim filed by a doctor. The letter, shown below, is characterized by Uretsky as "incomprehensible."

However, the professor goes on, after noting that he failed to comprehend it, to attempt to do just that!

Being a specialist in computer systems, Uretsky seems to have used that specialty to figure out a reason why the computer-generated output would appear the way it does.

He claimed the Blue Shield computer has developed a new arithmetic system which said the doctor had submitted a bill for $25, and since the computer considered the $25 was less than the $20 deductible, no payment was available.

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Computer-generated letter rejects a claim filed by a doctor.

It's a good try, professor, but it doesn't happen to be accurate.

Actually the form put out by the Blue Shield computer is quite comprehensible, providing you use the appropriate tools of understanding. These do not, in this case, really involve computer expertise but instead are formally taught in the archaeology department of the university! A certain amount of ethnology is also useful.

The Taylor Report
By
Alan Taylor, CDP

Studying the meaning of computer-generated output is like studying the meaning of computer manuals. It really boils down to the same type of detective work that is such an essential part of understanding the importance of an archaeological dig.

The phrasing of the form, or the manual, has to be considered in the light of just who, at what period of time, would have cut and pasted such a set of statements together.

Viewed in this light, the form may at first remain incomprehensible, but at least the attention of the reader is focused upon the actions of the systems designers rather than the literal meaning of the phrases.

In fact, what the form is communicating is a $15 mystery. Blue Cross does not concern itself at all with the $25 bill. It only considered a $15 basic charge.

Assuming this basic $15 entry, the computer then reviewed this part of the charge against a deductible allowance for Uretsky. The deductible allowance for radiology is included in a joint section for diagnostic X ray and laboratory tests. Apparently since the beginning of whatever period is concerned – probably since Jan. 1, 1974 – no claim in either of these areas has been accepted by Blue Shield.

What they did then was to allow a $15 charge conditional upon an already paid $20 deductible, and then, noticing that there wasn't a paid deductible, increase the "amount already paid towards the deductible" from a $0 to $15.

So much for what appears to have actually happened. The question becomes why Uretsky deemed it incomprehensible and came up with a wrong explanation.

It's a Secret

Again archaeology and ethnology can tell us the answer. Throughout history man has kept certain matters secret. Sometimes it has been the position of a good Pharaoh's last resting place, sometimes it is the name of a god.

This seems to be what has happened here. Of course, the printout could be put into plain English. However, such a printout, while stopping some of the complaints, would focus the subscriber's attention both on the $15 charge and on the whole secrecy. One can see that this would be unwelcome and that while the printout has to provide all the available information, the more attention directed away from "the body" the better.

In many ways, then, *within the definition of the system* the designers of Blue Shield printouts so heartily criticized by Uretsky should be complimented. All the available material is present. There are strong reasons why the omitted material is not present – contractual terms probably, tradition otherwise. The results of the use of the form are generally satisfactory and complaints, even when they come from well-educated and motivated sources, can be often sidetracked.

Now, whether the success in sidetracking complaints should earn a high grade in New York University's course I don't know.

But I do hope that when he presents the case to his students and later grades their responses, he checks to see that they at least get an understanding of the real system problems involved in computerizing applications which have, as a prime prerequisite, a requirement that the people who pay shall often be unable to check whether their bills are exaggerated.

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Based on 'Skills Inventory'

Well-Set Career Paths Provide Healthier Working Environment

By Patrick Ward
Of the CW Staff

NEW YORK – Although computer people have reputations in other corporate departments as "overpaid technicians" who "can't be satisfied" and thus switch jobs often, the best DP people tend to move on because their work environment

Professional Development

is lacking, Charles D. LaBelle, assistant vice-president of the Manufacturers Hanover Trust Co. (MHT) said here recently.

Such people are professionals, LaBelle said, and expect a professional approach within their industry.

His own firm launched a multifaceted program early this year to attract and retain good DP people, so that MHT "could most economically meet its desired data processing goals."

LaBelle described two facets of the program – career development and manpower planning – which he said go hand in hand.

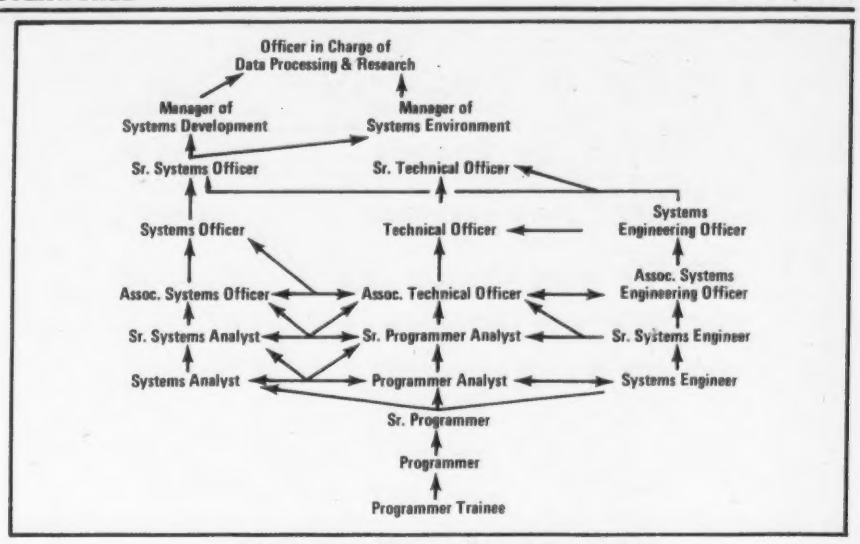
How Do I Grow?

Career development at MHT attempts to answer such employee questions as Where am I going in the organization? Can't I have something different to do? Does management really care about me, or are they just using me? Do politics determine if ever and how fast I will move?

The mechanics of MHT's career development scheme include a career ladder for both systems and programming and operations people.

The systems and programming ladder for entry level people starts with a required programmer trainee position and climbs to the senior programmer level before the person decides between systems analyst, programmer analyst and systems engineer paths.

The first path eventually leads to project management, the second to technical, non-managerial roles and the third path to positions in the software or technical support departments.



Manufacturers Hanover Trust Career Ladder

There is mobility from one path to another, LaBelle noted, and salaries are set so a "technical person would not be forced into management because of salary limits." Bank officerships are available to both managerial and nonmanagerial staff members, LaBelle added.

There are also detailed job descriptions for all the jobs across the three paths, he noted.

But what's crucial is a "quantitative tool that can measure, keep track of and help in the development of the total spectrum of skills . . . needed by a person on a job."

'Skills Inventory'

So MHT turned to the "skills inventory" concept, defining 55 skills necessary for different jobs in the DP installation.

MHT's skills glossary lists four levels of expertise for each skill, ranging from awareness to expertise.

MHT has developed a "skills matrix" that ties each of the four levels of proficiency into every systems and programming job.

The result is a standard for the range of skills necessary for each job.

"By storing this standard as one data base, and storing the actual standing of each person as another, we are now able to provide management with a dynamic tool for career development," LaBelle remarked.

Each DP employee and manager receives an individual skills profile. This document lists each of the 55 skills, and then compares the person's actual proficiency in each skill against what is required for his present job or the job to which he is aspiring.

There is a "minimum acceptable entry level for each skill for a job, and a level . . . to be reached while in that job," LaBelle added.

At the right of the document is a list of the company's educational courses that will remedy an employee's particular skill deficiencies.

'People' Person

The manpower planning group is charged with administering the career development program. At its head is a "seasoned data processing search executive – a real 'people' person.

"His job is to aid the managers in creating a mobile environment, whereby individuals can move between projects to gain experiences. He also acts as an ombudsman outlet for people when the managerial interaction is not working properly," LaBelle said.

The program seems well on the way to success, and MHT has had no turnover tied to the reclassification and skills identification process, LaBelle said.

"No one suffered salarywise or gradewise. In fact, a large percentage of people benefitted."

The best part is "that we rarely lose a good person now for the wrong reason," LaBelle concluded.

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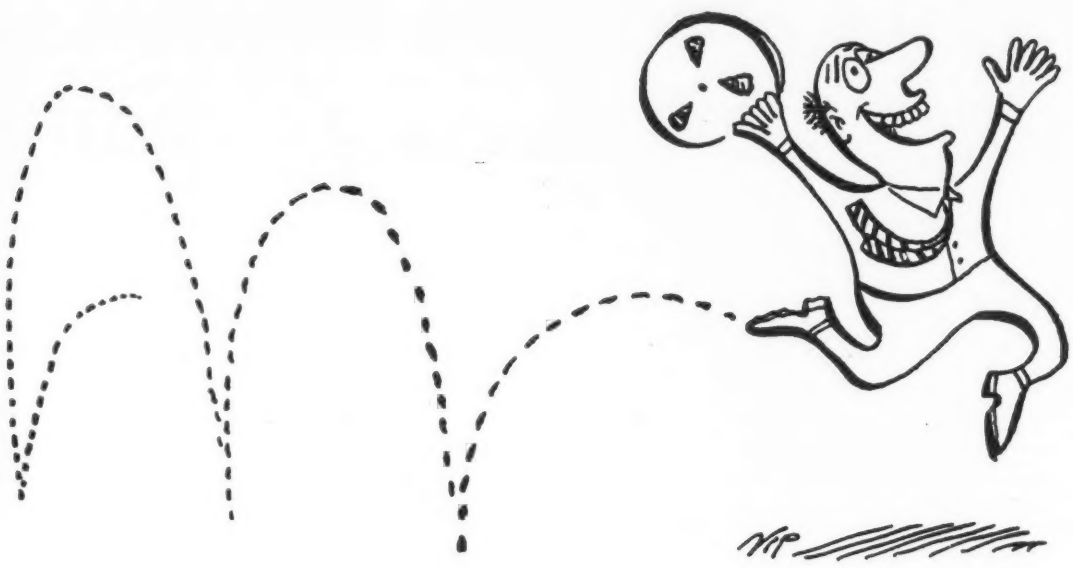

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Milwaukee Bank, London Office

Control of Foreign Branch Eased With GE Network

MILWAUKEE – Sometimes a user's business operations take such a radical twist that an otherwise well-planned in-house hardware system and DP staff cannot solve a problem that must be solved. What is needed – and available – First Wisconsin National Bank has discovered, is a capability that supplements the existing DP center.

Largest commercial bank in the state, First Wisconsin has automated the accounting and reporting system of its London branch utilizing General Electric's Mark III computer network. The Milwaukee main office receives full reports about the branch's position and activities every noon – including foreign exchange profit and loss, financial statements, maturity schedules and credit limits control.

In 1968, First Wisconsin decided to establish a branch in London to satisfy its customer needs for off-shore financing. This was to be the bank's first office in a foreign country, and, like many other American banks, many new problems became evident: new business environment, logistics complications and the attraction of capable overseas personnel.

All these initial problems were solved in due time and the London branch opened in 1969, a spokesman related. Like the majority of other American banks' branches in London, a traditional manual accounting and reporting system was instituted to provide necessary support to the dealing operation – confirmations, ledger cards, payments and so on – and also reports to branch and main office managements.

By late 1970, with the increasing uncertainties in foreign exchange markets, the need for an improved reporting system became evident.

At that time, three alternatives were considered: to improve the manual reporting system, to install data processing equipment at the branch and then transmit data to main office, and a new concept involving a worldwide network computer serivice.

The attempt to improve the manual reporting system proved fruitless, the spokesman said. If the bank acquired DP equipment in England and prepared the necessary programs, most of the objectives would have been satisfied. However, that would have meant the investment of capital and DP personnel in London.

Network Approach Attractive

The computer network approach seemed to combine several attractive features. It involved the installation of remote terminals at the London branch to input raw data to GE's Information Services network. In this approach the main office would have as much access as the branch to the data files and technical service of the system could be achieved from Milwaukee.

Two specialists were assigned to design and implement a computerized system using the network approach. One was highly qualified in computer systems and the other had experience and understanding of foreign exchange and Eurodollar trading and mechanics.

Design of the software was complex, with important features covering daily accrual, daily calculation of profit and loss of foreign exchange, printing of confirmations, compliance with Bank of England and Federal Reserve banks reporting requirements and ability to handle the variety of transactions used by the London branch.

One of the first orders of business was to solve a basic communication problem: the jargon used in the data processing and international banking fields was not the same in Milwaukee as it was in London.

As soon as the programs were ready, the familiarization of clerical personnel with input formats and the inputting of all the outstanding transactions of the London branch began.

Each day at 11 a.m. Milwaukee time, the London branch closes. Then the main office accesses the network to receive all managerial reports for the day, including a position for each one of the currencies the branch is active in, the foreign exchange profit or loss for the day and a full financial statement.

On the operational side, confirmations, paying and receiving instructions and ledger cards, among others, are also important output to the branch. Other reports that are available on demand by either the branch or the main office give the degree of detail necessary to satisfy most inquiries.

Master 4 Operating Systems From CDC Include Dual 3000 Processor Support

MINNEAPOLIS – Control Data Corp. (CDC) has announced the immediate availability of a software operating system, Master 4, for users of the firm's medium-scale 3170, 3300 and 3500 computer systems.

Chief among features provided by Master 4, and not available with early versions, is provision for its use with configurations containing two identical central processors in all three mainframe models. Master 4 Package II applies to multiprocessor 3170 and 3300 systems, and Package III to dual 3500 processor systems. Package I is used with all single-processor CDC 3170, 3300 and 3500 configurations.

In addition, a series of enhancements to previous Master versions has resulted in overall throughput improvements ranging from 15% in the single-processor mode to 80% in a multiple-processor environment, the company claimed.

These enhancements include a reduction in the amount of central memory required for operating system routines that results in the availability of more central memory for users' specialized application programs.

Another technique is "paged input/output pathing" that specifically takes advantage of the multiprogramming software features of the operating system.

Other features include dynamic load balancing or "time-slicing" that automatically adjusts the priority of a task each time it is selected for execution from the "ready" string. Tasks with high I/O frequency are assigned higher priorities than compute-bound tasks.

New control card and subroutines have also been included to allow improved restart and recovery of files being created should a system malfunction occur, and phased postprocessing of output that occurs simultaneously with job execution.

Under CDC's policy of separate pricing for software operating systems and programming packages, charges associated with the Master 4 products are as follows:

Package I – $1,200 initial fee and $120 monthly royalty.

Package II – $1,500 initial fee and $240 monthly royalty.

Package III – $1,500 initial fee and $300 monthly royalty.

Ansi Fortran 2 – $600 initial fee and $120 monthly royalty.

Ansi Cobol 3 – $600 initial fee and $120 monthly royalty.

'Proglook' Monitor Update Watches VS Performance

ATHENS, Ga. – OS/360-370 users operating under MFT, MVT or VS1 release 1.6 can make detailed measurements of programs as they are running, with the updated version of the $450 Proglook monitor package now available from Cosmic.

Originally developed by the Stanford Linear Accelerator Center for Nasa, Proglook consists of two programs, Progtime and Progplot. With it, the user can ascertain what action is necessary to improve the performance of the application program being monitored.

Progtime uses the control clock to catch a picture of any program running under it and records this information in a data set.

The new version of Progtime uses an improved technique to eliminate interference from other jobs in the system. It will also properly time programs using the Load macro. These improvements increase the usefulness and accuracy of the system considerably, Cosmic said.

Progplot accepts the specially formatted data sets and prints summaries of the observations. The two programs work in conjunction with each other to produce graphs that show where the program has spent its time (both run and wait time) and how performance can be improved.

Coding of Proglook is largely Assembler, with Fortran IV used in some routines. Cosmic did not provide storage requirements, but noted that the package contained "approximately 2,901" card images.

Cataloged as Program Number COS-02251, Proglook can be acquired from Cosmic at Suite 112, Barrow Hall, 30602. Documentation is separately priced at $7, a Cosmic source added.

On-Line Money Mart Planned

STAMFORD, Conn. – Once the Transamerica Foreign Exchange service (Tafex) becomes operational later this year, bankers will have a high-speed, subscriber-controlled environment in which "virtually every currency" in the world can be traded against U.S. dollars, the firm said.

Subscribers to this service can enter bids or offers on any currency in any quantity they desire using CRT terminals equipped with optional hard-copy printing devices. The system will match up all available bids and offers.

Tafex permits each subscriber to define credit limitations and relationships with other subscribers and integrates this into the bid-and-offer matching process. In addition, subscribers will have the ability to review the current market on any currency within a few seconds. A subscriber can also review any or all of his outstanding bids or offers and modify these to keep pace with any observed change in market conditions.

The system's bid-and-offer matching process is designed to match the highest bid and lowest offer of a particular currency on a first-in-first-out basis.

Tafex is also offering a specialized service in the form of an "observer" subscription.

Charges for the service have not yet been determined. Tafex Systems Corp. can be reached through P.O. Box 299, 06904.

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Students Apply Systems Concepts at User Offices

By Leslie S. Spencer
Special to Computerworld

INDIANA, Pa. – The School of Business of Indiana University of Pa. here has as one of its major fields of study a major in Systems Analysis. The primary goal of the program of 10 courses is to prepare the young analyst to enter industry as a programmer, a programmer-analyst or a systems analyst without further formal training.

A second goal would be to produce an analyst who can move into middle management.

The training includes a thorough exposure to general education courses and business courses, such as accounting, finance and marketing to make him at home in any business subsystem. He has been trained in several business-oriented computer languages to allow him to coordinate systems and programming efforts.

He has a good understanding of business systems, their objectives and their inadequacies. He is able to develop new systems or to redevelop current systems to make them more effective.

Actual industry experience by the student allows him to understand the testing of his classroom theory to business applications.

The undergraduate program in the School of Business consists of 52 hours of general education courses, 42 hours of business subjects to include accounting, finance, production, etc. His major field includes three semesters of Cobol, RPG and Basic, three semesters of systems analysis and design, one course in computer technology and a course in quantitative methods using the computer in statistics, economics and operations research.

The young analyst prepares studies with different outside corporations for three courses. These studies are done in the offices of computer users.

The first course concerns itself with the computer room facilities, the second with the documentation of a present business system and the third covers the selection of a project, the preparation of a proposal for the system study, a present business system description, a new design and a second proposal for the approval and implementation of the new system.

Graduates of the program are usually started as Cobol programmers and after one year are moved into the analyst field.

Course Overview

- The business information system course analyzes MIS, IMS, etc., and studies the accounting system and its subsystems of payroll, cost, accounts receivable, accounts payable and other business functions. The student visits a company and prepares a paper which documents a present business subsystem used by that company.
- The Cobol I course covers the establishment of programs for payroll registers, invoice registers, accounting journals and ledgers.
- The Cobol II course prepares programs utilizing disk and tape files, update programs, edit programs and the processing of accounts payable checks and accounts receivables statements utilizing tape and disk files and card input.
- The business systems technology course cover the CPU, data collection devices, communication devices such as front-end processors, communications controllers, input/output devices such as card readers, paper tape readers and punches, optical mark and character readers, output devices such as printers and computer output microfilm techniques.
- The data base design course studies the design of information systems such as data management, data bases and data base management systems.
- The first systems analysis course prepares the student to analyze a new system in an actual company situation. The student selects a company, and then selects a project for which he prepares a proposal prior to the start of the second systems analysis course.

The student learns the techniques of analysis and relates to a systems cycle and the logical sequence in use of the techniques in the systems cycle.

- The second systems analysis course requires that the student spend two days per week in a company's office preparing an actual study of a business system.

The student spends between 50 and 90 hours in the company office. All work is done without interference by the professor.

- A quantitative course trains the student in the application of the computer using Pert, CPM, linear programming, matrix algebra, regression analysis and forecasting, which will allow him to aid the industrial engineer, the operations research scientist, the economist and the statistician, as well as top management, in optimum decision-making. The course also covers management games and trains the student in strategies.

The Association for Systems Management (ASM) and the Data Processing Management Association chapters of Pittsburgh have been instrumental in review of and recommendations to the program.

The systems analyst major was started in the fall of 1968 and was reviewed by ASM Pittsburgh in the spring of 1971.

Leslie S. Spencer, CDP, is an associate professor, School of Business, Indiana Univeristy of Pa.

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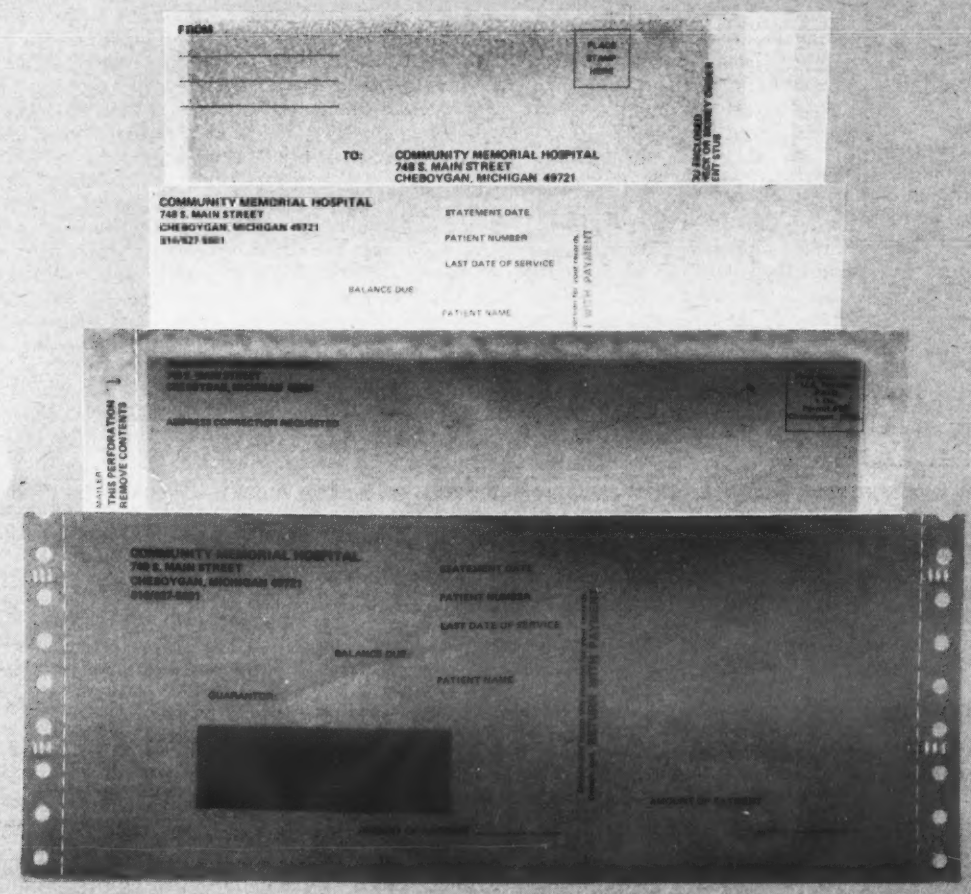

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Data Base Approach No Panacea for Mid-Sized Banks

By Leo J. Cohen
Special to Computerworld

Data base and data base system design can be thought of as a generic problem of computing, which is then applied to industries. And for the banking industry in particular its application must be considered carefully.

Bankers have assumed too much and taken too much for granted with respect to computing. They are used to the purchase of machines that provide turnkey functions. The savings account calculator and the equipment in the transit room are two examples.

This turnkey attitude toward banking operations has been extended to software packages that accomplish explicit functions for the banking industry.

But even though individually each one is a turnkey operation, overall they may make the bank a run-time mess.

The functions handled by turnkey packages are not really stand-alone, and very often must be integrated with one another.

It is the mid-size bank ($200 million to $800 million or so) that is usually cornered in this regard. Banks below this range are probably not dependent on their computing, at least not for growth.

The mid-size bank, however, is currently in a tight competition environment and very likely depends on computing efficiencies to provide the elbow room in operations for growth.

Viewpoint

As a consequence, many computer rooms in mid-size bank operations are stuffed with a staggering array of packages, programs, systems, media and their data. And then along comes the data base.

Whatever else it may be, a data base is not a turnkey operation. There is no way a bank can buy a data base system package, install it and turn its attentions to other problems on the convenient assumption that the data base question is solved, and that it has, in turn, taken care of almost everything else.

In fact, the considerations a data base raises are questions that none of the functional packages have brought up before, and probably has a dimension of complexity that few banks, particularly those in the mid-range, are prepared to handle even if they are interested in handling them in the first place.

Commonly, personnel associated with the computing center in the mid-size bank have been with the computing department from its early history. Such talent may be too close to the trees to see the forest; data base system designs that come directly out of the computing group are often simply restatements of the current file-oriented computing configuration.

Little if anything is accomplished in the way of file interrelationships, and not much is done to reduce data redundancy.

Such people usually also have a notion of a "natural" association of banking data, derived from the package-imposed importance of CIF and "associated" data. In the data base context, however, performance criteria form natural associations for data, and for the mid-size bank without extensive computing power, performance has to be a serious issue.

The computing staff of a mid-size bank often does all of the work in the daily computing context: OS maintenance, application program development, management of data entry systems, ongoing debugging and documentation.

But the computing department often does not have an organizational hierarchy of any significance. The department head, and perhaps a project leader seems to be sufficient to satisfy the operational needs of such a group.

In the data base system environment, however, the end users are involved in the definition – all of them, and jointly.

Furthermore, there is the question of authority in such organizations. Very often a systems group stands higher in the overall organization than any applications or operations people. But in data base there are bank-wide responsibilities for the management of data and the administration of the data base system.

The computing organization of the mid-size bank is usually close to the top echelon of bank management, and this puts it in a prime position to make recommendations that would lead to a more effective organizational arrangement for data base systems.

These are long-term projects and may well reach three to five years into the future. This represents a degree of planning that is very much different than the systems group experiences, say, a mortgage loan package.

Where in the bank is data base administration carried out, and how does its organizational structure support it? The office of the data base administrator (DBA) is responsible for all policies affecting the data base system and the computing environment that is host to it.

This suggests that the DBA function be carried out from some point above the DP group within the organizational structure of the bank. Ideally, it is best served as a vice-presidential position providing access to the other operating and service arms of the bank's organization on the one hand, and access to the president on the other.

A talented technician might be elevated to a vice-presidential position and given the DBA job. But such a person very likely has only a limited view of the banking business, objectives and the operational nature of the bank's activities outside of the computing environment.

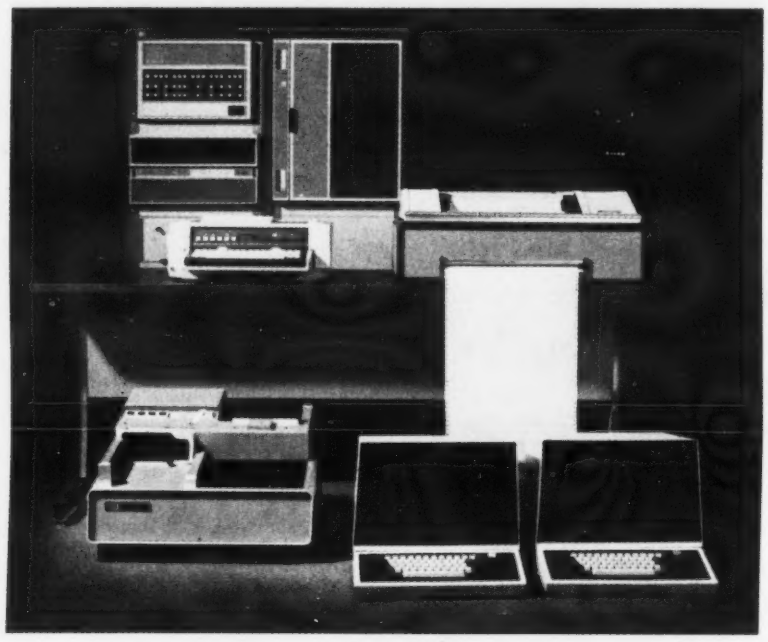
This suggests, then, that a current officer of the organization be assigned the DBA task, but have available the technical talents necessary to decision-making regarding data base in the current computing environment, the policy-making considerations that have to be taken into account and policy enforcement.

Leo Cohen is president of Performance Development Corp., Trenton, N.J.

Conference on EFTS Planned for October

CHICAGO – A working conference on electronic funds transfer systems (EFTS), scheduled by the Bank Marketing Association for late October at the Hyatt Regency O'Hare Hotel here, will focus on how the interrelationships of the finance, operations and marketing areas of a commercial bank apply to two EFTS services: direct pay deposit and intrabank transfers.

Intended for commercial bankers and their DP staffs, the final agenda will be determined by responses to a questionnaire to be distributed in early summer, a spokesman noted from association headquarters, 308 W. Washington St., 60606.



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Transmits to 370/158

System/3 Acts as Remote Controller for 3270 CRTs

By Patrick Ward
Of the CW Staff

RAHWAY, N.J. – Merck and Co. has been using IBM 3270 CRTs interfaced to System/3 processors that allow its regional warehouses to do both local data entry/inquiry and batch data collection for central site use.

Merck modified the original IBM software, interfacing the System/3 Model 10 and 3270 displays. IBM, in turn, now markets the Merck software, under the name of On-line Order Entry System. The package costs $375/mo for 12 consecutive months, after which the charge is waived.

Merck's "distributed processing" system involves 16 warehouses for the distribution of finished products in major cities across the country. In each warehouse, clerical workers use two or four 3270 CRTs for on-line order and receivables entry, cash entry and customer maintenance and inquiries, according to John Edson, divisional manager of systems programming for the firm.

The system provides day-end reports, and then the data is loaded on disk for overnight unattended polling from an IBM 370/158 here.

Transmission from the warehouses is on dial-up lines using ICC 2,400 bit/sec modems to a 3705 front end, Edson noted.

The 370 obtains sales, receivables and inventory information, updates each warehouse's inventory profile nightly and sends orders for the products each warehouse needs to Merck's manufacturing facilities.

Merck sent out over 40 requests for proposals when it was contemplating going to such a system in 1971, Edson said. The distributed processing approach had appeal because it offered on-line CRT use, without the heavy line costs accessing a central computer would have involved.

And for the forseeable future, the warehouses' limited needs would not require the variety of information available from being on-line to a central computer site, Edson noted.

At the time, IBM offered an interface for its 3270s and System/3s, Edson recalled. Merck decided to develop its own monitor system, however, beyond what IBM offered.

Merck purchased both the System/3s and the terminals. Both resale value and support were prime factors in IBM's favor, Edson explained.

Before going to the system, Merck had relied on tab shops in each of the branches. Staff members there combined product cards and customer header sets in a "sandwich," adding quantity and price on the product cards through a mark/sense process.

The tab equipment would produce an invoice, and the cards would then be hand-sorted for local sales analysis before being airfreighted on a daily basis to Rahway for processing.

But order volume was growing, and the company would have had to add more people if it had stayed on the tab system, Edson observed.

With the present equipment, the warehouse offices "actually have greater capacity with reduced staff." This is where the system's primary cost-avoidance benefit lies, Edson mentioned, though it also provides tighter inventory control in the warehouses, since there is no longer the wait for tab cards to come in from remote sites.

Edson said there are no operators or programmers in the warehouses, and the former clerical staff people who start and run the systems had no previous DP experience.

"When we go to a new release or enhancement we send . . . disk packs out to branches with a catalogue procedure and a letter that tells them how to load the system, and then they're off," he said.

User Casebook

"It's super that way," he remarked. "You don't get a call from Portland in the middle of the night, [after] some guy makes a change and says 'I can't get the thing to run.' "

The System/3's monitor, written by Merck, takes up only between 3K to 4K of storage, Edson said. There are about 30 modules involved in daily processing and between 10 to 15 CRT screens for users to call up, he mentioned.

The monitor allows as many as four operators to work with any combination of screens concurrently, he added.

Even with four operators entering four different kinds of data, the system is "amazingly fast for a small system" with no appreciable degradation, Edson stated. This may be due in part to using 32K machines, though the software could probably run on a 24K System/3 if necessary, Edson said.

AT&T High/Low Private-Line Rates Take Effect; Some Users May Have to Reconfigure Data Nets

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T's controversial high/low density rates for private-line users went into effect on June 13 despite a last minute request from the FCC for a postponement.

The new rates are a direct Bell reaction to the specialized carriers and will affect all users of voice-grade private lines provided by the Bell System for interstate service. Many will have to reconfigure their nets to find the most cost-effective routes.

The rates will reduce monthly bills for private-line users in the high-density (urban) areas while raising charges for users along low-density (rural) routes. Telpak rates will not be affected.

According to AT&T, about 19,000 private-line users will be affected by the rate changes which will be reflected in the next monthly bill sent to users. It is expected that most private-line users will receive reductions since most businesses communicate along the high-density routes. The exact percentage of users who will receive higher bills because they transmit data along low-density routes is not known.

The new rates will have an immediate impact on the specialized carriers since the AT&T reduction along high-density routes will put Bell rates below those of the specialized carriers in most cases.

Under previous private-line rates of Tariff 260, the phone companies generally were about 5% higher for voice-grade facilities than comparable services from the new carriers. It is expected that the specialized carriers will now lower some of their rates to again charge about 5% less than the new AT&T high-density charges.

For private-line users the task of designing a least-cost network under the AT&T tariffs now becomes a more complex problem. Under the previous rate structure, charges were based on a sliding scale which was mainly dependent on total mileage. For those planning their networks these old rates generally meant that the most direct route was also often the lowest cost.

But the high/low tariff complicates matters. In many cases low-density and high-density links will be joined together to tie a company's outlying branches to main sites. On data links where low-density areas connect to high-density areas, the tariff requires that the low-density link tie into a "homing center." And it is the locations of the homing centers that can complicate the network design.

It will be up to the user to configure the most cost-effective route for new networks. In additon, existing networks may benefit from reconfiguration to take advantage of lower-cost routes where possible.

Outside help to perform these network designs under the high/low rates is available from at least two sources. DMW Telecommunications Corp., 2975 Hickory Lane, Ann Arbor, Mich., has a Hi-D Lo-D Optimizer package that can configure least-cost nets. The package costs $3,500 plus installation and can run on mainframes which handle Fortran IV. An option allows the user to compare high/low rates with Bell DDS rates to find the lowest cost alternative.

Kranzley & Co., 101 South Kings Highway, Cherry Hill, N.J., offers the high/low Netsyn program as part of its Planet library of teleprocessing software. The package is described as a multipoint private-line network synthesizer which uses advanced Basic or Fortran IV. It is available for installation on the user's CPU or on the United Computing time-sharing system.

IBM also has a network optimization package called TP Net. It is used primarily to configure private-line networks for the company's customers in a marketing support function. Normally it is not supplied directly to users. IBM is studying whether TP Net can be modified to apply to high/low density network configurations but it is still too early to know whether this can be accomplished, a spokesman said.

Although the high/low rates have gone into effect, the FCC is still studying the rates and how they apply to the specialized carriers. The commission staff still is working on Docket 19919 and further hearings will be held on this proceeding. It is possible that the AT&T rates could be modified as a result of these hearings.

Indoor Laser Sends 9,600 Bit/Sec Data

ORLANDO, Fla. – International Laser Systems, Inc. has introduced a high-speed digital communications link for indoor applications which uses a laser beam to transmit data.

Called the DL-100, the system can transmit data up to 9,600 bit/sec at distances up to 3,000 feet, the company said. Each end of the link includes transmitter and receiver heads, a control unit, a TTY or RS 232 interface module and the user's terminal device.

The laser is suited to the indoor environment because it eliminates the normal atmospherics which "are deterrents" to outdoor laser systems, the firm said. No FCC license is required for the system.

A typical system costs $7,200 for full-duplex transmission capability. Delivery is 120 days from 3404 N. Orange Blossom Trail, 32804.

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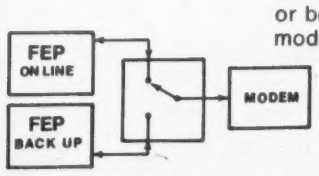

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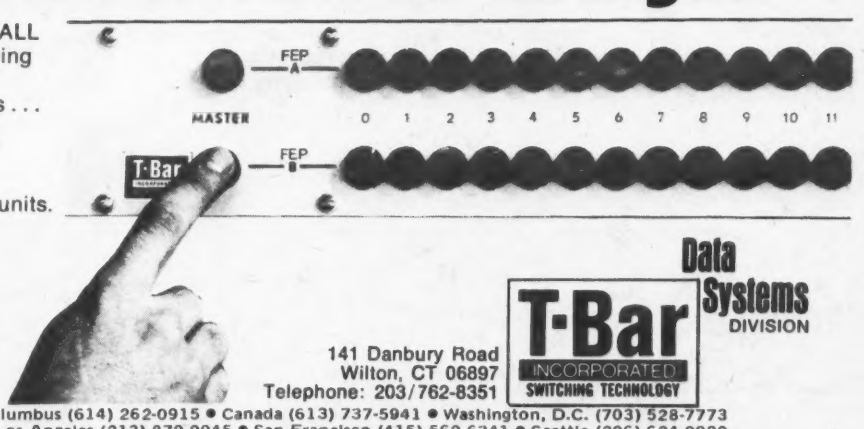

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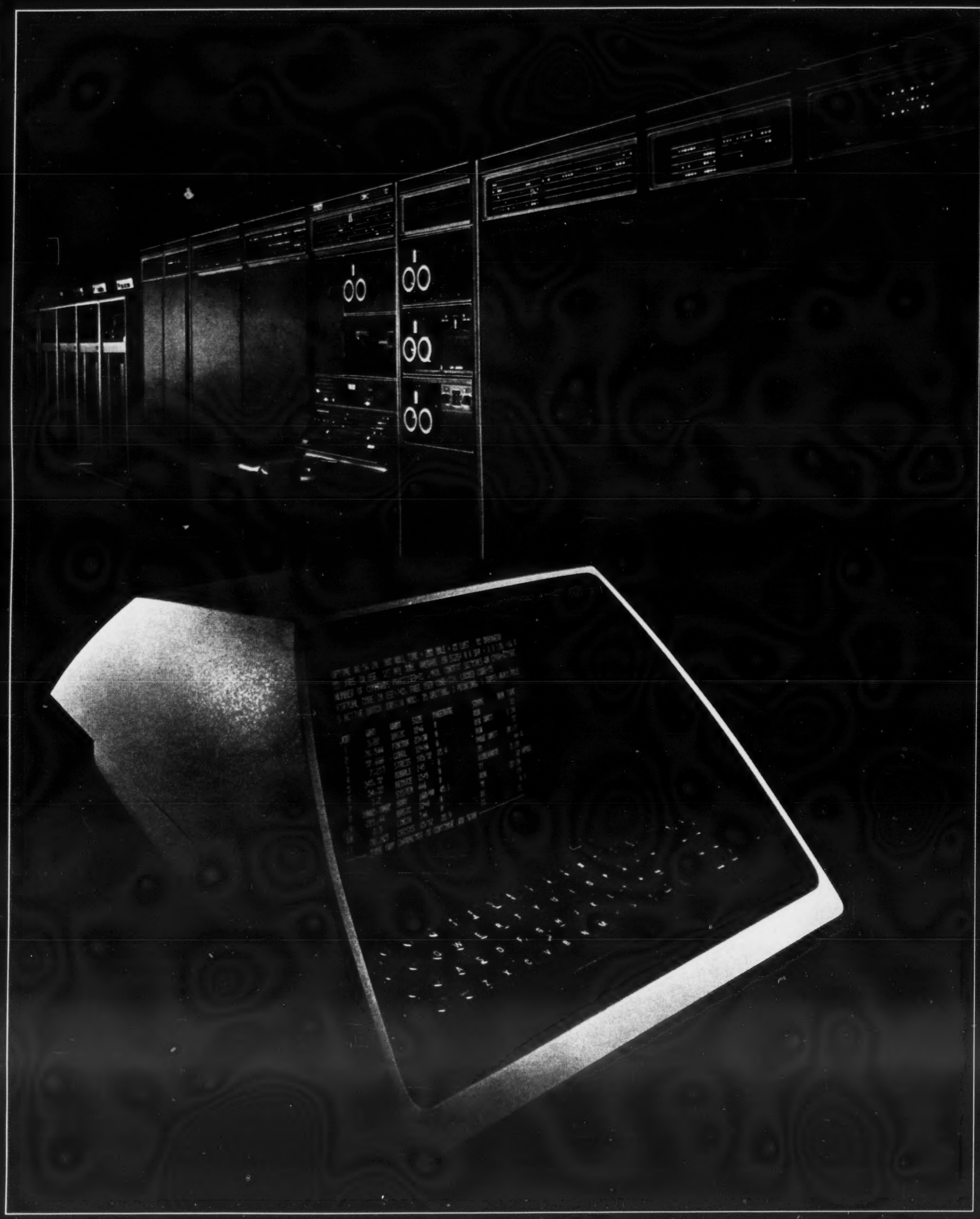

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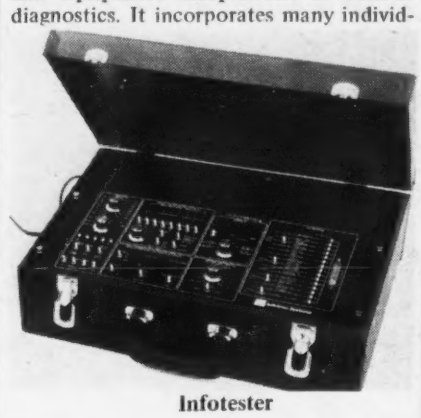
Infotron's Portable Test Set Analyzes Modems, Multiplexers

PENNSAUKEN, N.J. – The Infotester, a portable test set for analyzing major elements in a data network, has been introduced by Infotron Systems Corp.

The test set enables data technicians to check the performance of their networks and equipment independent of built-in diagnostics. It incorporates many individual test functions that might otherwise require separate test equipment.



Infotester

The Infotester is RS-232 compatible and can analyze synchronous and asynchronous modems, and frequency and time division multiplexers. Test results such as error counts, turnaround time and percent distortion are presented on a three-digit LED display.

The tester is a digital device and interfaces between the modem and the user's terminal.

The Infotester incorporates a combination of test functions including an asynchronous test generator and receiver, a synchronous test generator and receiver and a distortion analyzer.

Complementing the test functions are a common input/output control, display and interface functions. The tester costs $1,995 with 45-day delivery from 7300 N. Crescent Blvd., 08110.

Omnitec Has CCITT Coupler

PHOENIX – Omnitec Corp. has an acoustic telephone coupler manufactured to international (CCITT) standards.

The Model 704A features originate/answer modes, simultaneous teletypewriter and EIA RS 232 terminal interfacing, half- and full-duplex switching, optional hardwire (DAA) line coupling and upright/inverted frequency switching for application from domestic to international equipment or totally overseas application.

The unit costs $385 with delivery in two weeks from 2405 S. 20th St., 85034.

Terminal Housing Added by Hughes

OCEANSIDE, Calif. – A new desk-top housing for the Conographic-12 graphic display terminal has been added by Hughes Aircraft Co.

The housing is available as an option on the display system and it houses the scan converter, digital logic and power supplies of the terminal.

The Conographic displays utilize Hughes' Model 639 scan conversion memories rather than direct-view storage tubes, and include hardware for generating the full set of 96 Ascii characters, upper- and lower-case.

Hughes supplies the basic software required to convert the user's existing application software to the Conographic.

The housing package option is priced at $950 over the basic Conographic-12 graphic display which costs $13,300 from Hughes Industrial Products Division, 2020 Oceanside Blvd., 92054.

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THE COURSE

Structured programming is a very precise, very rigorous, very *successful* form of modular programming. The related concept of *top-down design* is a rigorous and orderly approach to the design of a program or system in which the design, coding and testing of high-level modules (e.g., "main-line" coding) are completed before that of the lower-level modules in contrast to the classical "bottom-up" approach.

Dijkstra invented it in 1965. IBM popularized it with their New York Times project in 1971. *Datamation* made it legitimate with their cover story article in December 1973 – structured programming and top-down design have finally become officially recognized. Several programming projects have demonstrated that structured programming can dramatically reduce development and testing time: one project experienced an average of only one bug per 10,000 lines of coding; another project was successfully implemented with virtually no systems testing; several others have demonstrated a programmer productivity of 3 to 5 times higher than normal.

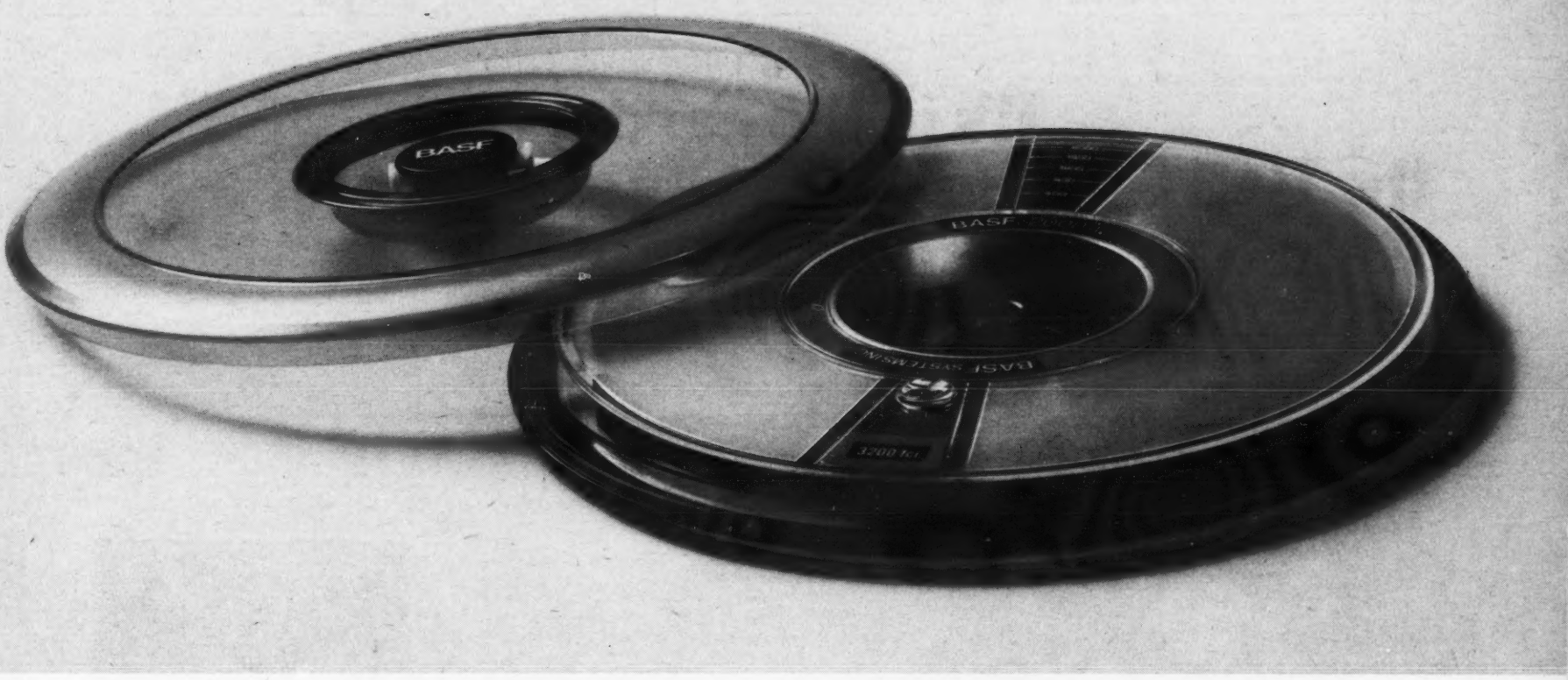
THE INSTRUCTOR

EDWARD YOURDON is lecturer, author and consultant in the areas of program design and on-line computer systems. He has presented over 150 seminars in structured programming, advanced programming techniques and real-time systems design in Europe, Canada, Australia and the U.S.A. His book, *Design of On-Line Computer Systems,* published by Prentice-Hall, is being used by numerous universities, and has been reviewed in Datamation (Dec. 1973) and *ACM Computing Reviews* (May 1973). He is currently completing another book entitled *Advanced Programming Techniques,* and has written a number of articles for *Datamation, Modern Data, Computers* and *Automation* and IEEE. Mr. Yourdon developed the PAL-III assembler for the PDP-8 at DEC, and has also held senior technical and management positions at General Electric and ELI Computer Time-Sharing. His practical experience with structured programming includes the design of a large payroll system for a major government agency in Australia, as well as a number of systems programming projects. Mr. Yourdon has A B.S. in mathematics from MIT, and has taught graduate-level courses at UCLA and RPI.

MAJOR TOPICS

1. **Introduction**
   Early work by Dijkstra and others; work by IBM; current developments.
2. **Theory of Structured Programming**
   The "black box" concept; Böhm and Jacopini building blocks: process boxes, IF-THEN-ELSE structures and DO-WHILE structures; reduction of programs to a single process box.
3. **Application to Common Programming Languages**
   The minimal set of programming statements; common extensions to the "pure" Bohm and Jacopini building blocks; structured programming in COBOL PL/I, FORTRAN and assembly language.
4. **Techniques of Structured Programming**
   Relationship to top-down design; duplication-of-coding technique; Ashcroft-Manna technique; Boolean flag technique; special programming situations – e.g., end-of-file processing, etc.
5. **Other Aspects of Structured Programming**
   Useful programming conventions to complement structured programming; practical considerations: is it worth the effort? is it inefficient? is it inconvenient? are current languages adequate?
6. **Top-Down Design Concepts**
   Top-down design: designing the major functional elements before proceeding to the more detailed elements; top-down coding: writing the code for each level of design before proceeding to the *design* of the next lower level; top-down testing: testing the higher functional levels of a program before the lower levels have even been designed.
7. **Case Studies Exercises and Related Topics**
   The IBM New York Times project; the concept of chief programmer teams; egoless programming; other recent case studies, examples and class problems.

If you think all premium computer tapes are alike, take a closer look at BASF 2000/A.D.



Because all premium computer tapes are 100% certified and meet industry standards, you might think they're all equal. They aren't. The important difference is the margin by which a manufacturer's standards *exceed* industry standards. It's this extra margin that allows no margin for errors. Let's look at a few superior points of BASF 2000/A.D. computer tape:

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Rough edges and debris on tapes are the result of inferior slitting, which causes the coating to overhang the base. The projecting edges become detached by tape guides and drive rollers. The result: loss of head-to-tape contact . . . and errors. BASF has eliminated these problems with an exclusive double-cut slitting technique that keeps our tape edges perfectly debris-free.

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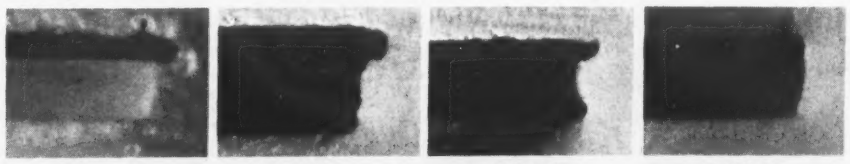
Another hassle, even with premium tapes, is edge waviness. This causes intermittent reading and writing errors. Dynamic conditions during tape transport can occasionally compensate for the waviness, so it's a tough job to track down. Again, our double-cut slitting technique keeps 2000/A.D. edges absolutely straight and symmetrical.



BRAND A BRAND B BRAND C BASF

Uniform width

Uniform tape width is essential, in order to avoid dynamic skew errors. According to industry standards, a width tolerance of ±.002" is acceptable. We peg our 2000/A.D. standard at ±.001". It's a small detail, but it could eliminate a few 3:00 a.m. debugging sessions.

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We've developed a new "hotter oxide" coating . . . a higher energy oxide that produces an output consistently higher than that of the National Bureau of Standards reference tape. Then we apply this oxide with a unique coating technique that provides a more even dispersion of oxide particles in the binder. For any bit density, including 6250 B.P.I., 2000/A.D. gives you more reliable writing and reading . . . better bit-to-bit uniformity . . . fewer drop-ins and drop-outs. And virtually no permanent errors.

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Head wear is inevitable, but it shouldn't be excessive. That's why we developed a finishing operation that gives 2000/A.D. a harder, smoother surface than anyone else's. It's a lot kinder to your tape head, and keeps your maintenance time to a minimum.

And in conclusion

2000/A.D. costs no more than other premium tapes. You're already paying for BASF quality . . . you might as well have it. For the whole story of how 2000/A.D. stacks up against the competition, write to BASF Systems, Crosby Drive, Bedford, Mass. 01730.

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DEC Expands PDP-11 2780 Capabilities

MAYNARD, Mass. – Digital Equipment Corp. (DEC) has introduced two software packages that emulate IBM 2780 terminals on PDP-11/40 and 11/45 systems.

The two packages operate with existing DEC PDP-11 operating systems requiring a minimum configuration of 48K words. The packages work with the RSTS/E (Resource Sharing, Time-Sharing (System/Extended, 32-user Basic System and the RSX11-D real-time multitask operating system.

The RSTS-2780 and the RSX11-D-2780 packages allow a PDP-11 system to communicate with IBM 2701, 2703, 3704 and 3705 front ends at a central site. The 2780 emulation operates over dial-up or private lines at speeds up to 4,800 bit/sec, and DEC will support systems using either Bell 208 or ICC data sets.

The software is designed for use only on point-to-point systems.

Configurations running under the 2780 packages can communicate with DEC systems running under Core-2780 and DOS-2780 software previously introduced by the firm. When not transmitting batch data to another site, the PDP-11s can be used for off-line operations.

A minimum PDP-11 configuration for either of the packages requires 48K words, an RK05 single platter cartridge disk and a second RK05, Dectape, 800 bit/in. or 1,600 bit/in. standard magnetic tape or 2314-type disk system.

The RSTS-2780 package costs $4,000 and the RSX11-D-2780 costs $2,500 as a license fee to the user. They will be available in August.

Communications Users Group Planned

FRAMINGHAM, Mass. – Individuals and organizations involved in data communications may soon have a national users group which will establish professional standards, serve as a spokesman on major issues and provide product planning information to the various equipment manufacturers.

The new association, to be called the Datacomm Users Group, is being formed under the sponsorship of Communication Trends, Inc., publishers of *The Data Communications User.*

Plans call for the Datacomm Users Group to include several regional units, each having at least one professional meeting per year, and there will be a national meeting open to all members.

Among the Datacomm Users Group objectives set by the acting executive committee are the definition of training and certification standards, identification of specialized research requirements and development of a medium of exchange for product and service information between users and vendors.

The committee also proposes the Datacomm Users Group participate actively in setting guidelines for organization structure.

Inquiries should be directed to the Datacomm Users Group Coordinator, Communication Trends, Inc., 160 Speen St., 01701.

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If you'd like to avoid data communications hangups, then communicate with us now!

If you're now involved with data communications (or will be soon), this unique seminar will teach you what you need to know about this complicated area.

This is the seminar that wraps it all up for data communications users. It's called *Data Communications – The Executive Imperative*, and it covers both fundamentals and applications-oriented subjects ranging from transmission theory to terminal selection techniques. It gives you what you need to know to plan effective communications systems in two busy days. And that's saying quite a lot. Because data communications is a complicated area with many problems for the user. Proper planning is a must. And this seminar tells you how to go about it.

Some of the things you'll learn:

- Basic terminology of the field.
- Tariffs and cost-savings.
- Effect of transmission problems on a network.
- The modem – how it works and what it does.
- Terminals and their performance.
- Multiplexing and data concentration.
- Line-control software.
- Network organization and design.
- How to upgrade to a bigger system.

Free reference materials and continuing updates

As a participant in the Data Communications Seminar, you'll receive a valuable set of reference materials prepared by the ICC Institute. These materials include a comprehensive 2-volume looseleaf outline of all course materials, a copy of "Data Modem Selection and Evaluation Guide" by Vess V. Vilips, a "Data Communications and Teleprocessing Dictionary" and a line-cost calculator.

And that's just the beginning. You'll also receive free update materials for a full year! This is more than just a seminar. It's a continuing reference service as well.

Seminar Leader is Dr. Dixon Doll, a highly respected teleprocessing consultant

Dr. Dixon Doll leads the expert faculty at this seminar. He has his Ph.D. in Systems Engineering from the University of Michigan and many years of experience in this field as a consultant and educator. He has performed work-study with communications techniques at M.I.T., taught graduate-level computer systems design, and has served as professional consultant to such firms as IBM, Raytheon, ICC and MCI. Dr. Doll is in charge of our faculty of experts, and takes an active part in the entire seminar.

You should attend this seminar, if . . .

- You are currently involved in data communications on a management or operational level and wish to expand your knowledge of the field.
- Your company will be going into this field in the near future.

Charges and Enrollment

The total cost for this two-day seminar is $350, including workbook, reference materials, year-long update service, luncheons and continental breakfasts. This cost does not include hotel rooms, if necessary.

To enroll, look over the schedule below, fill out the coupon and send it in. Remember, enrollment must be limited, so don't wait until it's too late!

Data Communications, The Executive Imperative

Course materials and outline prepared by the ICC Institute.

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Bits & Pieces

Prime Minicomputers Get 2314-Type Disk Drives

FRAMINGHAM, Mass. – Prime Computer, Inc. has added a 25M word/spindle 11-high disk drive to its line of peripherals for the Prime minicomputers.

The drives utilize 11-high disk packs and information can be recorded in IBM 2314-compatible format or in a user-specified recording mode.

The disks are supported by Prime's Disk Operating System which provides file management resources, including random and sequential file access methods.

Price for the 25M-word disk storage unit is $20,000. The controller unit, which handles up to four disk pack units as well as one fixed-head disk (either 128K- or 256K-word capacity) sells for $5,000.

Prime is located at 145 Pennsylvania Ave., 01701.

Flexifile 52 Dual Floppy Disk Interfaced to DEC PDP-11 Mini

MOUNTAIN VIEW, Calif. – The Flexifile 52 floppy disk system from Tri-Data Corp. includes two disk drives, a built-in controller with formatting electronics and a power supply.

Its on-line capacity is 512K 8-bit bytes in a 16-sector, 64-track format with a data transfer rate of 31 kbyte/sec.

The unit accommodates an additional two-disk slave system which increases the total capacity to 1M-bytes. Access time is 10 msec track-to-track.

Tri-Data plans to offer interfaces and cabling for most popular minicomputers, and has immediately available an interface for Digital Equipment Corp. (DEC) PDP-11 minicomputers. The Flexifile 52 with interface is priced at $5,200.

The firm is at 800 N. Maude Ave., 94040.

Photoelectric Tape Readers Range from 80- to 150 Char./Sec

SANTA ANA, Calif. – The minicomputer user who wants to increase input speed and flexibility over traditional teletypewriter systems without a major increase in cost, may benefit by using the 2000 series tape readers from Remex, according to the firm.

The photoelectric readers have input speeds ranging from 80 char./sec in the Model RR 2080 to 150 char./sec in the Model RR 2150. The unidirectional devices stop on character and will read tapes of 5 to 8 levels. A single circuit card provides DTL or TTL compatibility.

The RR 2150 is priced at $510 and the RR 2080 costs $445, including power supply, from the firm at 1733 Alton St., 92705.

Datapro Survey Reports

Independent Tape, Disk Users Content

By Vic Farmer
Of the CW Staff

DELRAN, N.J. – Users of independent tape and disk drives are generally happy with their IBM-compatible units, but tape drives are rated lower in terms of reliability and associated maintenance costs, according to two recent surveys conducted by Datapro Research Corp.

About nine out of 10 users of IBM-compatible disk drives rated the overall performance and ease of operation of these devices as "good" or "excellent," and eight out of 10 users assign high ratings to the drives' reliability and the vendors' maintenance service.

The ratings assigned by 185 responding users with a total of 2,044 non-IBM disk drives formed this profile of overall user satisfaction:

	Excellent	Good	Fair	Poor
Overall performance	54%	37%	8%	1%
Ease of operation	64	33	3	0
Hardware reliability	43	37	18	2
Maintenance service	34	45	14	7

These disk drive results are reported in a $10, 22-page report, "All About Plug-Compatible Disk Drives," available from the firm.

Up to the Task

In the report, Datapro said many peripheral companies "have proven they can design and build first-rate equipment at lower prices than IBM. There is every reason to believe they can continue to do so in the face of stiffer competition from IBM."

But Datapro sees IBM's vulnerability to competition slowly eroding, and the reason is simple: "When the independents began their assault on magnetic tape and disk drives in 360 installations, IBM was vulnerable on both a technical and a price basis.

"Over the past two years, however, IBM has become more receptive to price and innovative competition.

"The net result for the user is more processing power per dollar," according to the firm.

Datapro does warn that because of today's tough and competitive market, "it is to the advantage of the computer user to stay aware of statistics on who, what and how much."

Now that IBM 3330-type drives are being attached to 360s, Datapro cautioned, double-density 2314-type drives would probably vanish entirely if the price of the available equipment was not priced so low.

"Prospective buyers should note there were a number of different ways of implementing double density, each having certain performance advantages. Very careful considerations need to be given to the performance aspect before taking advantage of 'bargains'," the study noted.

Two questions on the disk survey were asked to shed light on the potentially troublesome areas of installations and maintenance.

First, the users were asked what problems, if any, were encountered in installing and testing their IBM-compatible disk subsystems. Of the 183 users who responded, 33% reported no problems, 53% had minor problems and 14% experienced major problems.

Second, the users were asked what problems, if any, they have encountered in diagnosing malfunctions and obtaining the necessary service. Although 38% reported no problems, 47% have had minor problems and 15% have experienced serious problems, said Datapro.

Datapro's survey of 93 users with 876 IBM-compatible tape drives is reported in the firm's buyer's guide "All About Plug-Compatible Tape Drives," another $10, 22-page report.

The ratings assigned by the 93 users were combined into this profile of overall user satisfaction with tapes:

	Excellent	Good	Fair	Poor
Overall performance	41%	44%	14%	1%
Ease of operation	52	44	3	1
Hardware reliability	36	34	20	10
Maintenance service	33	45	12	10

Datapro is located at 1805 Underwood Blvd., 08075.

Parts of Entrex 480 and 280 Used for 380 Key-to-Disk

BURLINGTON, Mass. – Entrex has taken the central control group of its 480 key-to-disk system and combined it with the lower priced small-screen Data/Scope keystations of its 280 data entry system to come up with a medium-priced data entry system.

A typical 15-station System 380 would lease for less than $1,500/mo under a three-year lease.

The central processor can contain up to 48K bytes of core memory and the system can be expanded to 22 Data/Scopes per central processor. Each Data/Scope, which displays up to 360 characters on its screen, leases for $45/mo under a three-year lease.

Lease contracts for one year, two years and five years are also available.

System 380 was designed, according to the firm, for users who require data entry systems smaller or with less processing power than the System 480, which handles up to 32 keystations per processor, but more than the System 280, which handles up to 12 keystations per processor.

System 380 hardware options include an additional 2.4M-byte disk, 1,600 bit/in. magnetic tape, a card reader, on-line printer and data communications features.

System 380 software includes as standard all the basic data entry capabilities of the System 480, including Entrex's "HELP!" key which guides the operator throughout the keying process.

The system will be available in 60 days.

Entrex is at 168 Middlesex Turnpike, 01803.

Card Reader Handles 1,000/Min

MELBOURNE, Fla. – Documation, Inc. has released an M1000E card reader that reads 80-column cards at 1,000 card/min. The hopper and stacker capacity is 1,500 cards, and the unit uses a vacuum picker.

The M1000E is priced at $4,000 from the firm which can be reached through P.O. Box 1240, 32901.

Ampex, Caelus Prices Up, Varian Cuts Disk Costs

Three firms recently made price changes in their peripheral product offerings.

Both Ampex and Electronic Memories and Magnetics (EMM) attributed announced increases to inflationary pressure. Ampex raised prices on digital tape and disk products within a range of 4% to 12%.

EMM raised prices on its quantity purchase of Caelus disk drives about 5%, but hit single purchases much harder . . . reportedly up to 50%.

Varian Data Machines (VDM), on the other hand, dropped prices on its 14.5M- and 46.7M-word disk drives 26% to 33%. It cited volume manufacturing as the reason for the decrease.

VDM's single spindle 14.5M-word disk memory and controller was $24,000 and now sells for $16,400. This master unit can control up to three 14.5M-word drives. Formerly priced at $16,500 per unit, these drives are now $12,150 each.

VDM's dual spindle 46.7M-word disk memory and controller was $45,000 and is now priced at $30,300 per unit. Its 46.7-M-word drive units were $37,500 and are now $25,550 each.

Who can sell computers in Japan?

In Japanese it's called **Shukan Computer.** In English, it means **"Computer Weekly".** Whatever you call it, it's an excellent vehicle for marketing EDP products and services to the second largest EDP market in the world (and the fastest growing).

A joint venture of **Computerworld** and Japan's leading electronics publisher, Dempa Publications, **Shukan Computer** is the first computer newsweekly for Japan. Its initial circulation of 35,000 is divided 80% to end-users and 20% to the computer industry, so Shukan goes to the people you want to reach in a market which is growing at a rate of 23% a year in installed value.

The latest census of general purpose systems revealed that there were 14,806 systems installed as of September, 1972, a 1-year gain of 3,569 units and $911 million in installed value. 1972 imports were over $360 million, so there is a lot of business being done by U.S. firms.

With **Computerworld** representatives across the U.S., it's easy to advertise in Shukan. Just send in the coupon. We'll send you media information and a free copy of our Market Briefing Bulletin: "EDP Marketing in Japan".

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Please send me more information on Shukan Computer and marketing in Japan.

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PDP-8, -11-Based Systems Made for Industrial Users

MAYNARD, Mass. – A series of off-the-shelf computer systems designed for industrial users has been announced by Digital Equipment Corp. (DEC). Incorporating DEC's PDP-8 and PDP-11 minicomputers, the integrated hardware-software packages have been designated the Industrial 800 Series, for systems employing the PDP-8 computers, and Industrial 1100 Series, for systems employing PDP-11s.

There are three systems in the Industrial 800 Series, with prices ranging from $17,900 to $24,000; there are 10 Industrial 1100 system packages with prices from $25,450 through $77,000. Deliveries of Industrial 800 and 1100 systems are scheduled for late 1974.

The Industrial 800 Series employs DEC's Industrial Basic software, supported by the company's OS/8 operating system. Industrial Basic is a modified form of the Basic language, tailored for real-time industrial control situations. Smaller, minimum-configuration 800 series systems employ magnetic tape units; more extensive systems use disks for data and program storage.

The Industrial 1100 systems employ the new RSX-11M software package. This software, upward-compatible to RSX-11D, will permit the user to perform multiprogramming real-time operations on his system, resulting in the most efficient allocation of computer resources for industrial operations.

Xerox Control Unit Microprogrammable

EL SEGUNDO, Calif. – A microprogrammable controller with a throughput rate of 2.86M 16-bit word/sec has been announced by Xerox Corp.

The System Control Unit (SCU) is designed to provide high data throughput and extremely fast response to interrupts. Response to fast interrupts is 350 nsec and multiplexed interrupt response is as fast as 1.05 μsec, the firm said.

SCU capabilities include I/O controller and/or preprocessor for a host computer, device controller for peripherals, communications system controller, special algorithmic processor, computer emulation system and a video display controller.

A unique "Tribus" architecture, organized around three 16-bit parallel buses, permits up to three data transfers to occur concurrently within a single microinstruction. Data may be intermixed bytes and 16-bit words.

The SCU's arithmetic, logic, interface and microprogramming capabilities allow creation of custom instructions and sequences.

At the same time, the SCU is not subject to the constraints a fixed instruction set imposes on a minicomputer, Xerox said.

Features of the SCU include 4K to 256K words of 32-bit control memory, 4K to 64K words of 16-bit data memory, eight general purpose registers and up to 128 I/O addresses.

The SCU is available with a wide variety of standard peripheral interfaces as well as a generalized I/O structure which permits interfacing with all types of devices, and the SCU has been interfaced to Xerox CPUs.

Minimum price for a single SCU is $4,500.

OEM Products

Floppy Disk for CA Mini

WESTLAKE VILLAGE, Calif. – Kennedy Data Systems, Inc., has introduced its Model KDS 28 C floppy disk system for operation with Computer Automation Alpha 16, LSI-1, LSI-2 and Naked Mini processors.

The new system utilizes two floppy disk drives, Kennedy's proprietary controller, a system power supply and all cables and hardware for table or rack mounting, all in a single cabinet 5-1/4-in. high.

Price in OEM quantities is under $3,300 per system. Kennedy Data Systems is at 31829 La Tienda Drive, 91361.

OCR Reader Has Auto Feed

SILVER SPRING, Md. – The Computer Entry Systems Corp. Model 7100 OCR document reader, designed to satisfy requirements of low-volume data entry applications, is now available with an automatic feed attachment.

A stack of documents at least 5 in. thick can be inserted into the auto feed.

The auto feed attachment is priced from $750 in OEM quantities. Basic 7100 document reader prices with OCR-A read capability start at $5,450. Other available options include an audit trail printer and 1428 read capability.

Small Drive Uses 3M Disk

PLAINVIEW, N.Y. – The Qantex 600 tape drive occupies 3-1/8 in. by 7 in. of panel space and uses the 3M tape cartridge to give 1/2-in. tape performance.

Digital data is recorded on 1/4-in. tape in up to four tracks. Data is written at a density of 1,600 bit/in. phase-encoded at 30 in./sec. This results in a data transfer rate of 48 kbit/sec. The unit also operates at 90 in./sec in bidirectional high-speed search.

Prices for the Qantex 600 start at less than $300 without interfaces from the firm at 200 Terminal Drive, 11803.

INTELLIGENT ALTERNATIVES.....

Intelligent DATASTATIONS™ for less than $150 a month*

Fairchild replaces your low-speed teletypewriter systems with a single, efficient and economical distributed intelligence network that can fulfill your message and data communications needs . . .

Stations communicate at high-speed over standard dial-up lines under the control of a central computer or a message switcher . . .

A broad selection of input-output devices provides DATASTATION configurations to meet specific needs at each network location . . .

The Fairchild DATASTATIONS provide . . .

Sophisticated Editing
Operators perform comprehensive editing at the DATASTATION keyboard to validate input data. A single character, line, or the entire message can be entered, deleted, or altered. Data search and scan commands locate characters quickly.

Computer Compatibility
Fairchild has hundreds of DATASTATIONS installed in networks using IBM CCAP System 7, 360/370's and free-standing message switchers.

Reduced Line Costs
DATASTATIONS dramatically cut data transmission costs by batching data and automatically transmitting at high speeds over dial-up lines. Solid-state buffering, integrated modem, and speeds up to 1200 baud combine to minimize line time.

Error-Free Transmission
Sophisticated error detection and automatic retransmission increase the reliability and accuracy of your entire network.

Reliability and National Service
Fairchild's famous semiconductor technology is the ultimate in reliability. More than 50 service centers and highly-trained customer engineers provide you nationwide installation and service.

* DATASTATION with KSR33, on a 5-year, full-payout lease with maintenance, is less than $150 per month. With the format option, it is still less than $150.

The Centralization Alternative—Part II

Three Centers to Access Corporate-Wide Data Base

By Patrick Ward
Of the CW Staff

PITTSBURGH – In 1969, Jones & Laughlin Steel Co. decided it had "just too much computer power" spread among too many plants, so the company began a DP centralization program that has so far cut the number of its computer systems from 25 to 14.

J&L's latest centralization effort focuses on the corporate computer system in Pittsburgh, where a 1.5M-byte dual processor Honeywell HIS 6060 will take over the workload of two IBM 360/50s and a large 360/40 by November.

An HIS 702 batch terminal accessing the 6060 system has already replaced an IBM 360/20 used as a terminal in a J&L research lab.

A second phase of this centralization program beginning in November is aimed at centralizing the company's Cleveland, Ohio and Hennepin, Ill., operations into the corporate center in Pittsburgh.

This will initiate the first on-line communications between these plants and will permit use of a corporate-wide data base.

The Celveland 360/50 is a batch-oriented CPU with a large production data base. The 360/50 in Hennepin also supports its own large data base plus eight IBM 2260 CRT terminals used for inquiry and file updates. The Hennepin site also supports a Data Pathing, Inc. (DPI) data collection system using 33 DPI input terminals and 15 Model 33 KSR Teletypes. Production recording goes on magnetic tape for later input to the CPU.

User Casebook

Off-Line Communications

The Cleveland, Hennepin and Pittsburgh CPUs presently communicate off-line, sending payroll data, order entry transfers and steel transfers between plants by means of Mohawk tape-to-tape transmission devices over dial-up lines.

When phase two is complete, all orders and inventories will be available on the central computer system, which will handle interplant product transfers by changes in location codes.

Terminals at the remote site will then print out the transfer information.

J&L had been using a homegrown data base management system on its IBM equipment, but now will probably go to HIS's IDS, according to James Mages, director of management information services.

J&L plans to install dual 9,600 bit/sec circuits to Cleveland and Hennepin this fall, and will later upgrade them to 19.2 kbit/sec.

The firm is also considering a circular 56 kbit/sec data communications net with concentrators in Chicago, Detroit, Cleveland, Pittsburgh and Indianapolis. The company would probably retain some 19.2 kbit/sec lines between the concentrator sites as backup, Mages said.

J&L originally approached this centralization with some trepidation, Mages said, mostly because of the firm's mixed experience with communication circuits.

New digital offerings from Bell and MCI, however, may provide both cost savings and, more importantly, greater reliability than J&L had originally expected, Mages commented.

Conversion Eased

Conversion software has eased the task of converting J&L's applications systems from IBM machines to the 1.5M-byte dual processor 6060, Mages said.

HIS and J&L modified Honeywell's Conversion Aid Packages (Caps) to fit the "unique instructions used in our programs," he explained.

Now J&L's IBM source Cobol is processed through Caps and the output is compiled. Then, Mages said, "we use the auto update feature of Caps through remote terminals to handle any instructions that were not converted."

J&L has also developed its own software to process IBM source programs in Caps and to generate job control for the Honeywell compiler. So the programmer doing conversion does not have to produce job control for either step, Mages remarked.

Another program takes this job control and produces a flowchart that shows and identifies input and output files and documents.

In about half of the conversion cases, the programs compiled cleanly without programmers modifying any instructions, Mages said.

The third phase of J&L's consolidation program involves conversion of a batch-oriented 360/40 and a 360/30 that has been supporting a terminal in Houston.

Both of these CPUs run a significant amount of IBM 1401 programs under emulation. J&L will rewrite the 1401 programs, convert them to Cobol and add them to the HIS system's workload.

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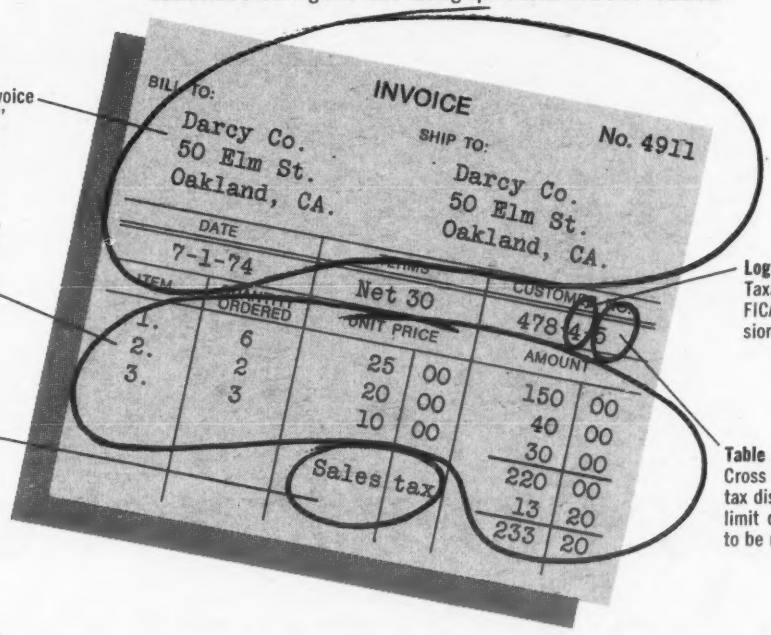
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TERMS Net 30
CUSTOMER NO. 478476
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For Individualized, Competitive Service

In-House Mini Provides Bank With Needed Flexibility

ST. CHARLES, Mich. – If a small bank is to remain independent and survive, it must provide customers with individualized, "close-to-home" and competitive services, but in recent years this has become increasingly difficult, according to Robert Loomis, president of Community State Bank here.

The steady rise in the flow of paper, and especially the tremendous increase in the use of checks, has forced many small banks to trade away a bit of control and independence in exchange for the tools required to remain competitive, he explained.

Loomis is no longer pessimistic, however.

He thinks his bank – a state-chartered commercial bank – has found a solution.

Minicomputer Is Solution

The key to Community State Bank's solution is the advent and availability of sophisticated, economical minicomputers.

"Several years ago, demand deposit accounting (DDA) had increased to the point where we could no longer cope with it using our in-house equipment, which included nothing more sophisticated than bookkeeping machines," Loomis said.

"We simply could not justify the huge costs and additional staff required for the computer systems then available, so the service bureau approach was our only realistic alternative – and it did enable us to handle the load. But it was not a completely satisfactory solution," he contended.

Lacked Control

"We got the tools we needed," said Loomis, "but the tools were not in our own hands. Consequently, we did not have the control we were accustomed to and couldn't always provide our customers with the services they expected and deserved.

"Response time from the service bureau was erratic, delays due to our low priority were frequent and our documents and records had to leave the bank for processing."

The Small Systems User

Dissatisfied with the service bureau arrangement, Loomis continued to look for alternatives. Then, late in 1972, Pert Corp. of Saginaw, Mich., proposed a solution: an in-house computer system based on the Qantel minicomputer.

"When the in-house system was first suggested," Loomis said, "there were quite a few skeptics around the bank, myself included, who questioned whether it was feasible for a bank of our size to obtain and operate its own computer.

"But the system has been installed for about a year now, and there are no skeptics left," he continued. "There were no catches and remarkably few problems."

Many people still think of computers as large, costly behemoths which can be afforded only by large firms and operated only by trained specialists. But this new breed of computers is user-oriented, economical enough to be used in small businesses and yet powerful enough to permit a variety of applications.

Community State Bank is using its system for DDA and savings and is in the process of putting its loans on the system.

"This system has not only allowed us to regain control of our DDA operations," he said, "but has enabled us to increase the efficiency of the full range of banking services. For example, we were recently able to offer our customers daily interest savings – a service which simply was not feasible until we had our own in-house system."

The simplicity of operation afforded by the system was not merely a desirable extra, according to Loomis, it was one of the primary considerations in deciding to go with the system.

"No programmers or specially trained technical personnel were needed," Loomis said.

"It was a true turnkey installation, with Pert providing all the technical guidance needed to install and operate."

As with most banks, demand deposit transactions at Community flow to the proof department from various sources . . . tellers, cash letters, mail.

During the proofing operation, all items are magnetically imprinted with the amount and transaction codes. Batches are maintained with the total of each printed on batch total slips.

From the proofing area the batched documents enter the system via a 10-key (numeric cluster) input device, typewriter numeric keys or from the typewriter keyboard fitted with a keypunch overlay. The data need be entered into the system only one time.

If errors are detected, the operator is immediately notified and erroneous lines within a batch can be individually corrected.

Once the data has been captured by the system, all reports, advisories and statements are created by the system.

Files Dynamically Updated

Although data entry is batch-oriented, all files are dynamically maintained and updated so the system can respond to account status inquiries in an on-line mode.

Outputs provided by the system include daily reports of overdrafts and nonsufficient funds activity, large item activities and significant balance change, stop-payment suspect lists and dormant accounts, as well as daily trial balances.

Monthly customer statements are printed by the system and can be generated on a staggered-cycle basis keyed to the account numbers. Individual statements for a particular account can be obtained at any time.

"This is no stop-gap solution," he asserted. "In its present configuration, the system can easily accommodate twice our current volume and, beyond that, the system itself can be easily expanded."

Why haven't more small banks gone this route? According to Loomis, it's simply a matter of education.

"The economical, user-oriented minicomputer system is just now coming into its own. Five years ago such a system just didn't exist," he said.

It's taken a while for the technology developed in the 1960s to reach the end user, the small businessman, but it now has arrived.

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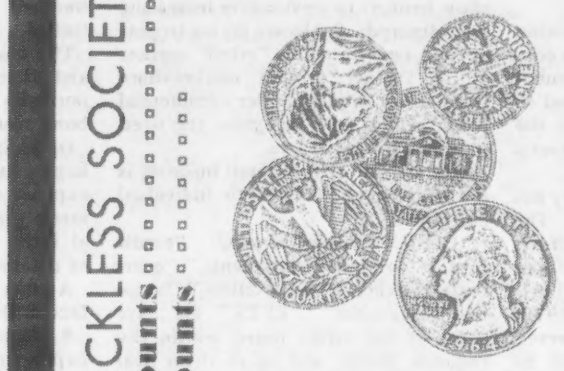
BANKING



How computers are used in banking has far greater impact on everyone in the country than how the machines are used in almost any other industry.

For the banks themselves, electronic data processing affects the basic ability to function and the profit and loss of the institution. But even more significantly, the hardware, software and communications capabilities that exist right now are already shaping, indeed shaking, the way the public is served. And the public's attitude toward the new banking environment.

This special report trys to sketch out the how and why of electronic funds transfer systems (EFTS). At the same time, however, it seemed useful to document the trends in the hardware and software being used to support both EFTS and conventional banking applications.

Personnel training and retention have often been major problems; some time is spent seeing how one major bank has solved its particular problems in this area.

This sharing of information and experiences will, it is hoped, give those in banking new ideas of how to do their work, and those outside the industry some idea of what banking will mean to them in the surprisingly near future.

On the Inside

DP Should Help Control Costs, Gain on Competition S/2
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EFTS Leaves 'Positive Attitude,' But Fears Persist S/6
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System Applications, Purchasing Practices Queried S/14

This special report was prepared by Don Leavitt, *Computerworld*'s Software Editor.

DP Should Help Control Costs, Gain on Competition

By Mark Smylie
Special to Computerworld

The data processing function within every commercial bank should be concerned with control of costs, potential "fee income" opportunities related to data processing and how to use the computer as a tool to gain or protect a competitive edge in banking.

Historically, the banking industry has been geared to funds placement. The banks have concentrated their efforts in building lending and credit staffs to administer to the loan portfolio. Forecasts of banking trends for the 1970s and 1980s generally agree, however, that one banking problem will be funds acquisition, not funds placement.

Since the mid-1960s loan demand has been ever increasing. Placement of funds has not been the prime concern.

Source and cost of loanable funds is now, and will continue to be, one of the major banking problems.

The man in the street is a major source of low-cost funds which will allow bankers to service ever increasing loan demands. Banks are trying to gear up and penetrate this "retail" market or to further protect market-share from major money center commercial banks which now recognize the need to attack the retail area.

One way to attract retail business is to offer more services to individual customers.

"CIF," "point-of-sale," "credit card," "combined statements," "overdraft banking," "total tellers," "automatic branches," "EFTS," etc., are some of the terms heard within the industry today, and all of them deal with assuring a bank a greater portion of the retail market.

Servicing "retail banking" will put an obvious strain on most in-house bank DP capabilities.

Of obvious concern to bank executive management is earnings-per-share performance. Increasing concern for the "bottom line" is caused by several factors. Interest rates are closely watched and will be somewhat controlled.

The cost of funds is also increasing, and therefore margins on the loan portfolio are fairly predictable. The bond market is no longer without risk.

Operating expenses (DP is the third largest expense item – next to interest expense and banks building and equipment – in most banks) are increasing at faster rates than source and margin of income items.

Among the major problems bankers face in DP today are:

- Control of costs. Most banks are experiencing increases of 15% to 25% annually in total DP costs. Personnel expense increases (average man-year costs) are 9% to 11%/year in most banks. The compounding effects of these percentages on any DP budget yields some very interesting numbers.
- Personnel turnover. This is due to limited career paths, salary scales, etc.
- Knowledge of available data processing services. There are over 4,000 individual vendors of DP equipment, programs, and supplies.
- Requirements for new marketing services.

Most banks are finding it very difficult to attract and retain good people to operate their computer centers. The situation will worsen.

Unbundling has produced increased prices for DP and a proliferation of vendors. This has further increased the demands for good people with the result being that salary structures in the DP department generally exceed pay scales found in other bank departments.

In summary, bank executive management is concerned with control of costs, bottom-line performance and competition from other financial institutions, and the DP function has to be able to support that concern.

Mark Smylie is manager of management services – banking, University Computing Co., Dallas, Texas.

EFTS Coming Nationwide As Marketing Efforts Expand

●Will Provide 'New Dimension' in Society
●May Lead to Nearly Checkless Economy
●Worldwide Money Network Possible

CINCINNATI – Electronic Funds Transfer Systems (EFTS) are coming. They may creep, jump or leap, but paperless transfer systems which currently exist in pockets around the country will generate the necessary volume.

The critical need now is for industry to go beyond studies and make the marketing move to EFTS.

This was the gist of comments made by Charles P. Jones, controller of the Federal Home Loan Bank of Atlanta, and Richard Collins, EFTS coordinator for the Federal Home Loan Bank System, at a recent meeting of the Federation of NCR Users.

Jones defined EFTS as systems in which information is sent from one geographical location to another by electronic impulses. The Federal Reserve wire service, he said, is the only true EFTS in existence today. This nationwide service transfers funds daily for commercial banks.

'A New Dimension'

"EFTS will provide a new dimension," Jones stated. "It should lead to the checkless or at least less-check society."

Jones pointed out that the use of checks has created two systems – transfer of funds or payments and the clearing of such transactions. Over the years, it has been necessary to make many laws, rules and regulations concerning the payment and clearing of accounts.

Banks now process some 24 billion checks annually and may be handling 40 billion to 45 billion funds transfers by 1980. The banking community, Jones said, will be hard pressed to handle the volume with today's paper processing equipment.

He stated that Negotiable Orders of Withdrawal (NOW) accounts will add somewhat to this paper volume. The NOW account, legal in Massachusetts and New Hampshire, has been called, he said, "a checking account that draws interest" and sometimes, "a savings account on which you can draw drafts."

The Atlanta payments project and Committee on Paperless Entries (Cope) group, Jones said, have developed the Georgia Automated Clearing House (ACH) which today is processing approximately 20,000 transactions per month. However, these transactions still entail much paper, he explained.

"Banks feel the ACH should be exclusively theirs, giving them a competitive advantage," Jones stated. "Thrift institutions, credit card companies, credit unions are allowed access through a bank only.

"Community clearinghouses could, for the most part, be operated by an independent and include a point-of-sale system. Direct access to the ACH exclusively has the potential capacity on the part of commercial banks via Scope (Special Committee on Paperless Entries) or Cope-type systems to electronically capture payrolls, and hence a greater ability to cross-sell savings accounts which has aroused the interest of savings and loans in ACH systems."

In Atlanta, Jones said, Western Electric now electronically transfers paychecks to banks designated by employees. The Social Security Administration is looking at the same idea for paying benefits.

Electronic Payments

In the future, he predicted, bill payments will be handled electronically. The customer will okay the bill and the merchant will electronically send the data to a financial institution which will electronically transfer the money from the customer's to the merchant's account.

"In addition, 46 stores in the Atlanta area now accept Bankamericard," Jones stated.

"Consumers buy groceries and charge them. It's a pilot which got great publicity and helped increase sales. The stores find that it takes less time to write a ticket than make change. And thefts and the amount of thefts are reduced.

"Savings and loans have long provided their customers with the service of cashing checks, and, in the process, direct payroll deposits among savings and loans have not been minimal," Jones pointed out.

"Like commercial banks, savings and loan associations in recent years have devoted greater attention to preauthorized payment services, seeking in general to provide more and better services for their customers. In the preauthorized area, savings and loans have been promoting a service designated Transmatic which was initially developed in 1968 by First Federal Savings and Loan Association of Lincoln, Neb.

Transmatic Drafts

"Transmatic is, in effect, a payment/savings plan whereby a customer preauthorizes his savings and loan to automatically prepare each month a draft drawn on his checking account at a commercial bank for the express purpose of either making a mortgage payment and/or transferring funds to his savings and loan savings account.

"The draft is deposited in a commercial bank where it enters and clears through the bank collection system. The paid draft is returned to the customer with his bank statement," Jones said.

According to Jones, many financial institutions either now issue, or have plans to introduce, debit cards. While these cards currently have little utility, most issuing institutions plan to expand the services provided through them.

Today, there are an estimated five million debit cards outstanding. This number may well increase several-fold within the

(Continued on Page S/3)

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Although Not a Large Firm

Aftech Strong on R&D for Savings and Loan Groups

COLUMBUS, Ohio – Heavy commitments to research and development are possible – according to most observers – only in large organizations or in dedicated R&D shops. Applied Financial Technology (Aftech) fits neither of those categories, but is deeply involved in research nonetheless.

Aftech is a service bureau for savings and loan associations (S&Ls) in this area and its client list is growing. It is a subsidiary of Buckeye Federal Savings and Loan Association and Buckeye is still the major client.

There are, however, six other S&Ls being serviced by Aftech and another will be added in July. Most are in Columbus, but one is in Mt. Vernon, Ohio, and the one coming on-line in July is in Charleston, W. Va.

Aftech's reputation, in fact, has reached halfway around the world and the company now has a facilities management operation for an S&L in Australia.

Having developed an on-line application package to support on-line cash dispensers from its 370/135, "Aftech is now paying more attention to data communications and support in a multiterminal, multimanufacturer, multiline discipline environment," company President Steve Guthrie said recently.

On-Going R&D Projects

It is also working toward having an on-line point-of-sale (POS) experiment in place – in a local supermarket – by December. And, less visible to the public but more useful to the client S&Ls, Aftech is interfacing its application programs with a data base management system.

Remarkable by almost any standard, this list of on-going R&D projects is even more impressive in light of Aftech's size. It has only 26 people in all, and only seven or eight of them are in DP development work.

The rest handle day-to-day customer support and operations, Guthrie explained.

Aftech dug into data communications primarily because its clients had a mix of on-line units installed, on order or under consideration.

"A rash of vendors is trying to modify off-line equipment to meet on-line specifications," Guthrie noted, "but few considered interfacing with other vendors' units."

Guthrie's crew now supports IBM 2980s, "a second-generation general financial teller terminal;" Burroughs TC700s, "which are equivalent to the 2980s;" and Burroughs RT2000 cash dispensers. Buckeye has three RT2000s currently on-line and seven more units (probably Docutellers) will be added.

Throughout its service network, Aftech is supporting 96 terminals.

It is in the process of adding support for a Bunker Ramo 2001 which one of Aftech's customers uses in a mobile branch installed in a bus that moves from location to location.

Aftech is also working with Docutel, Guthrie said, in converting that vendor's equipment from off- to on-line, and with Addressograph Multigraph in developing an on-line Amcat I POS device needed by the end of the year.

On-Line Cash Dispensers

The on-line cash dispensers are up 16 hours a day, from 7 a.m. to 11 p.m.

Although newly formed as a corporation, the Aftech team has been together for several years in support of Buckeye Federal's DP needs. The network they have developed has operated bisynchronously at 4,800 bit/sec, and "has served as a test site for experimental placement of some Bell System black boxes, data set things," Guthrie added with a note of pride.

The POS experiment for Buckeye will take several phases and has no expansion possibilities into other supermarkets unless the S&L has an approved satellite branch.

The process started with the installation of a 10 ft by 40 ft station in the middle of the supermarket. This is staffed by four tellers for some of the store's hours and the tellers conduct the full range of S&L business.

But the facility also includes a Burroughs RT2000 cash dispenser which can be used by S&L customers without teller help even when the tellers aren't there.

The next step is to install POS devices to handle funds transfers right at the checkout stands and to replace the cash dispenser with a full-service Total Teller, capable of handling deposits, account transfers and perhaps even utility bill paying, as well as cash dispensing.

Fully Machine-Oriented

"Our analysis shows that customers can be educated to use their savings accounts as demand deposit accounts (DDA) (checking accounts) through the machine interface," Guthrie went on. "Then we can take the manned station out of that store and be fully machine-oriented with seven POS units and the Total Teller." A magnetic-striped plastic card would be needed to trigger use of either the POS units or the Total Teller, he added.

With the permission of the Federal Home Loan Bank, which regulates S&Ls, the machines would be considered a branch even though there are no Buckeye personnel on-site, Guthrie said.

This fully mechanized branch should go operational by December, he added.

Although some witty observers have quipped that Buckeye's supermarket scheme "out-Hinky Dinkies Hinky Dinky," Guthrie feels any such comparison is unfortunate. The work by First Federal S&L at the Hinky Dinky market in Lincoln, Neb., [CW, Feb. 13] is "an outstanding operation" in its own right and was set up under different authority than Buckeye, Guthrie said.

Front-Ending With Total

Aftech is working internally with data base concepts and the specific chores of front-ending its current application programs with Total and Environ, the data base management and communications systems from Cincom Systems.

A five-month study of system architecture and interface problems is being spearheaded for Aftech by a pair of consultants from Neoterics, Inc. of Cleveland.

The basic work should be complete and ready for testing by mid-August, Guthrie estimated, "then we'll see the beginning of the rudiments of a full CIF potential. CIF is a part of data base management systems but it's the usage that makes it valuable," he said, adding that his crew is doing its work because Aftech hadn't been able to find anyone who had properly interfaced data base systems with applications for S&Ls in particular, or even commerical banking in general.

Having looked at many of the available data base systems, Guthrie couldn't find anything that was directly translatable to his needs, "but we couldn't see any point in starting at zero, when Total and Environ were already 80% there, and we only have to write 20%" of all the code needed, he said.

CIF/data base is a further enhancement to the Aftech system and as Guthrie's team "begins to plug all these different things together, I guess you do get something that we can be excited about."

EFTS Coming Nationwide As Marketing Expands

(Continued from Page S/2)

next two years.

Jones cited Wilmington Savings Fund Society in Wilmington, Del., as an example of an innovative mutual savings bank using the debit card.

"EFTS implies a nationwide or possibly a worldwide computer network," Jones summed up.

"The network will handle instant money, large dollar amounts and small dollar amounts. Anywhere . . . everywhere. Purchase in Tampa, pay seller from account in Duluth. The ACHs that exist today are the seeds from which the network will grow," he continued.

"EFTS will be implemented to make the organization serving the customer more efficient," Jones concluded. "In the course of implementation, service will be improved and costs and prices lowered."

Federal Home Loan Bank EFTS director Richard Collins stated it is clear the Federal Reserve Board is enthusiastically interested in EFTS, as evinced by the operation of automatic clearinghouses in Atlanta and on the West Coast.

Further support is shown by the formation of ACH study groups, he said. In addition, the board has called for comments on Regulation J concerning changes which will allow electronic information to be processed.

EFTS Coordinators

According to Collins, the Federal Home Loan Bank Board has appointed EFTS coordinators in each of its 12 districts to keep aware of activities at the grass roots level. Furthermore, in January a temporary regulation was passed permitting experiments with close observation.

Collins cited the operation by First Federal Savings and Loan in Lincoln, Neb., of two terminals in supermarkets for withdrawals and deposits as an example of what can be done. During the first six weeks of operation, he said, the association received net deposits of $600,000 and added 700 new accounts.

National and state financial associations are actively investigating EFTS, he said. In addition, the National Automated Clearing House Association is working on standards for interfacing ACHs.

Looking at all of the activity in the field, Collins cited five requirements for further progress:

- Broad involvement of national, regional, state and local groups.
- Small working committees to get the job done.
- Outside assistance from consulting groups specializing in EFTS.
- Funding on a shared basis.
- Concern for regulatory and legislative changes required to support EFTS.

"There now is a definite and critical need to move beyond studies," Collins summed up. "But industry itself must make the move to EFTS.

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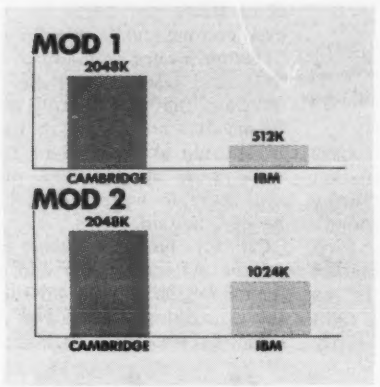

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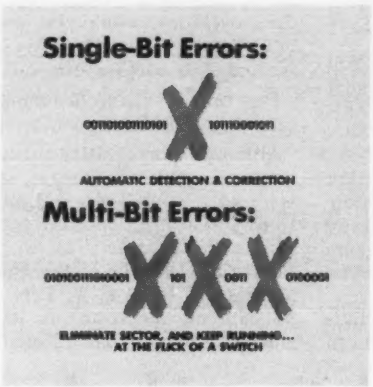

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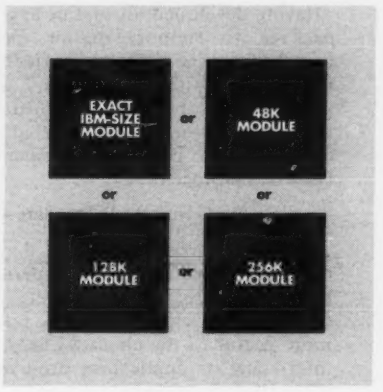

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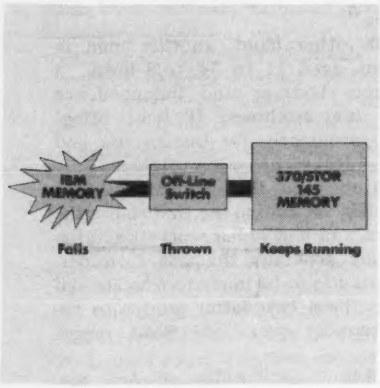

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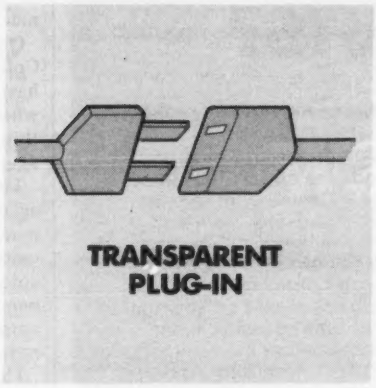

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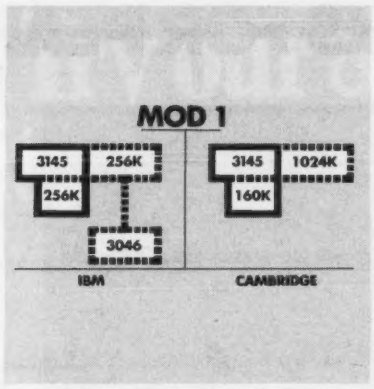

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Public Study Finds

EFTS Leaves 'Positive' Attitude, But Fears Persist

By Don Leavitt
Of the CW Staff

CHICAGO – Public apathy and opposition have been the hallmarks of most market research studies conducted before the installation of unattended banking machines or the implementation of other electronic-funds-transfer-system (EFTS)-related projects in limited geographic areas.

And a more sweeping study conducted by Social Research, Inc. for the Bank Marketing Association (BMA) found these attitudes do indeed exist, right across the country, largely in people who have had little or no exposure to the concepts of EFTS or experience with any of the "money machines."

Those who have had experience with automated teller units and related devices often have very positive attitudes towards them, but even then, a range of very specific fears about how the machines work and how the user has to interact with them also showed up in the BMA study.

Reporting its results in 1972, the BMA warned its banking clients, and the machine manufacturers, that these fears were real, were certainly justified and must be met if the use of the automatic units was to grow. More recent product announcements indicate the manufacturers have taken BMA's words to heart.

The demands, real or psychological, made by the units on the user were highlighted in the title of BMA's report on its study. To many readers, "Man's Interface with the Money Machine" leaves in doubt which – man or machine – is in control of the situation.

Man often feels uneasy in such an ambiguous situation, the study indicated.

BMA studied the attitudes of bank customers and potential customers in Atlanta, Ga., Columbus, Ohio, and Stockton, Calif., where automated banking equipment was already in use. Interviews were also carried out in other parts of the country where such equipment was not installed.

In Atlanta, Columbus and Stockton, general awareness and acceptance of the equipment was widespread. Elsewhere, even though they might have been unaware of automated tellers when first approached for the interview, respondents seemed able to conceptualize the equipment and its function, BMA found.

> *"The [money] machine ate up my husband's card . . . He tried four different numbers, then it took the card away. He was frightened, mad and felt rejected." – A dissatisfied user*

Public acceptance comes in stages and is often sharply affected by the potential user's own philosophy. A man in Columbus, described as a "Bohemian" in the 35 to 49 age range, gave vent to this blast, "I hate machines. All practical people hate them. Eggheads, aesthetes, clergymen, professors hate them. They see machines as a symptom. I never expect to use machines."

On the other hand, another man in Columbus, aged 21 to 34, told BMA, "I have more leverage and independence when I use machines. It [sic] brings things conveniently for instant use and disposal. I feel secure using machines."

The young and the professional/managerial class are among the first to use the machines, and blue-collar workers and the elderly are generally the last. Considerable effort has to be made to educate and persuade these two latter groups to become frequent users, the BMA report noted.

The 24-hour availability of some machines has appeal, but the positioning of the units in safe areas with good lighting is almost a prerequisite if the elderly, in particular, are to make use of the units.

"I have wondered about the risk to personal safety," an upper-middle-class woman (judged to be over 50), told BMA. "I think there is a great hazard after leaving the dispensing area. A great opportunity to be hit on the head."

The fear is not limited to women or the elderly however. A young man in Atlanta, described as an occasional user, talked about one of his experiences.

"One other customer was there using the machine. I watched him and he watched me to see if perhaps either one of us were robbers. I didn't feel secure making a cash transaction so late at night."

The time limits imposed by some machines caused problems for some users. Now a frequent user, a Columbus man admitted, "I waited a long time before I tried to use it. At first I wondered if I could do it right, because the time limit presses."

One of the most commonly mentioned difficulties or annoyances with machine use is the task of trying to remember the secret code number, required to validate use of the magnetic-striped card that trig-

(Continued on Page S/10)

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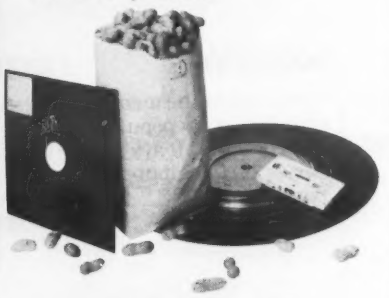

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'Major Evolutionary Changes' Making Mark on Bank Equipment

DELRAN, N.J. – "No matter what kind of financial institution you're associated with, you should be taking a long, hard long at electronic funds transfer system (EFTS) equipment now," "Datapro editor Dan Tanner warned readers of the research organization's new "Reports on Banking Automation."

Banking and thrift industries are in the midst of a "major evolutionary change in the manner of handling customer transactions and the means of using this transaction data to provide information to help control present operations and to plan for the future," Tanner said, recognizing the two-sided benefits and the inevitable nature of EFTS, now that equipment has generally caught up with concepts.

But there are other problems that confuse the scene. In the section on teller terminals, for example, he noted there are various factors to consider, but "perhaps most important of all is adaptability and growth potential – at least until the Fed [Federal Reserve Bank] and the host of other regulatory agencies finish shuffling the deck."

Another simile identifies another problem in the move to EFTS: "The public adapts to change about as well as a hen adapts to water," and the loss of cancelled checks as receipts is going to be hard to sell to many people.

For that reason, the transition from a paper-based system had best be gradual and well-planned, "without the trauma of sudden change." This can be done (presumably at commercial banks) by installing a teller information system "and keeping the window paper around for a while" or (at savings banks) by installing teller terminals that maintain passbooks, Datapro suggested.

The section on teller terminals is completed by detailed product reviews of 14 systems now being marketed to commercial banks and/or thrift institutions.

Automated tellers and cash dispensers are not necessarily all they're claimed to be, Tanner noted in the next section of his manual. There are five basic benefits often put forth as reasons to go to this type of equipment, but "there's a cloud in front of nearly every silver lining" and only one of these benefits is a sure thing.

Tanner spells out a list of capabilities the banker must consider in evaluating these customer-driven units. The list is time-dependent, however, since "the state-of-the-art is steadily improving . . . The costs of these machines are bound to go down while their utility will increase."

Before providing writeups of eight automated tellers and cash dispensers, the manual provides an extensive, but apparently not excessive, list of the categories of expense that can be incurred in the acquisition and continued use of such units.

Micr Hardware

Checks clearly will be around for some time, and one section of the Datapro report is devoted to Magnetic Ink Character Recognition (Micr) readers/sorters, reject entry units, proof machines, encoding machines and optical readers for Micr-encoded documents.

After outlining the ways in which the readers/sorters may differ – on- or off-line, number of pockets, speed and operational functions – the section then outlines equipment that is available. Finally, under the heading, "Another Way to Skin the Cat," Tanner noted the growing use of optical scanning in reading Micr, and under the heading, "And Other Ways to Use the Skin," he noted a variety of documents in addition to checks that can be processed if they are Micr-encoded.

Detailed descriptions of all the Micr-oriented equipment Datapro could identify follow the narrative introduction.

Credit authorization systems have come into existence, another section of the Datapro report noted, because the number of bank credit cards has tripled since 1968 (to a current estimate of 75 million) and the clerk-initiated telephone call creates almost more problems than it solves.

Planners have to choose between stand-alone units, used in conjunction with conventional cash registers or other existing point-of-sale equipment, and units that are built right into integrated POS systems. Credit terminals typically consist of an automatic credit card reader, a

(Continued on Page S/10)

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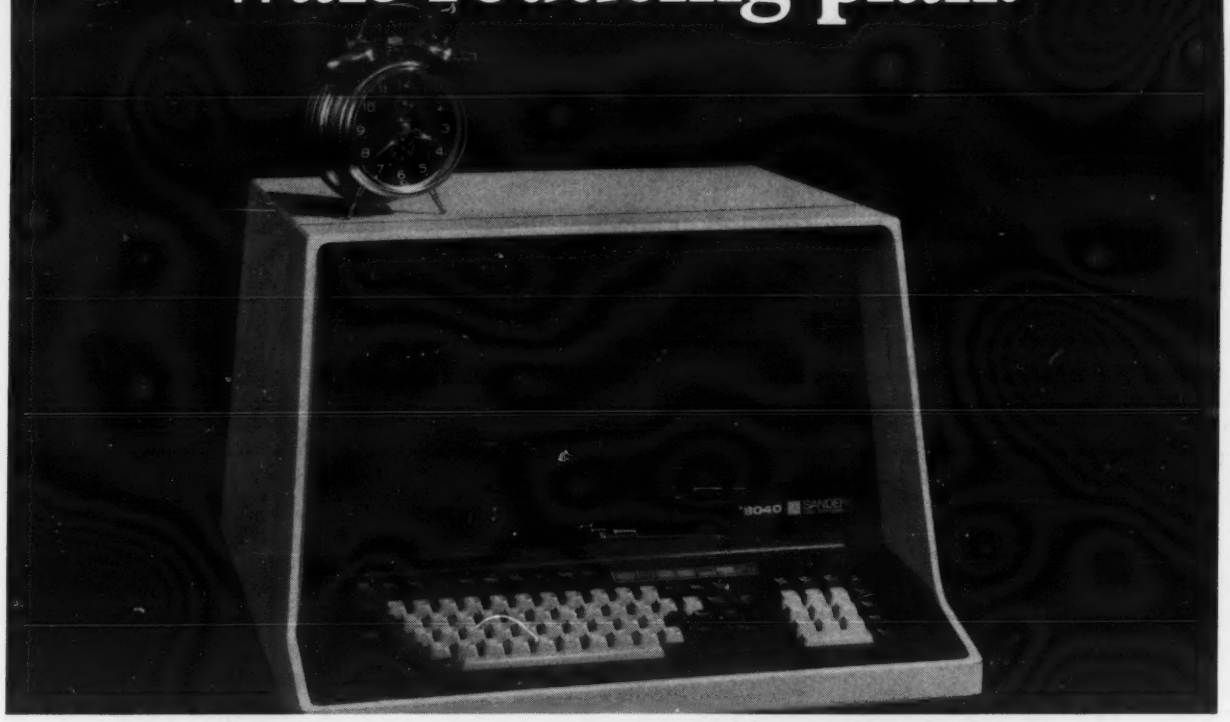

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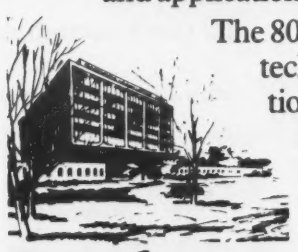

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With 363 Branches From Oregon to Mexico

Bank Solves Output Printing Problems Inventively

SAN FRANCISCO – Many DP installations have severe output printing problems, but few truly match the severity of the problem faced by Crocker Bank & Trust or have the ingenuity to solve the problem the way Crocker apparently has.

Banking regulations require customer transactions from all branches to be processed before the start of business the day after receipt. But Crocker has some 363 branches, spread from Oregon to the Mexican border, "and that means the bank has a big problem," Vice-President Roy A. Mitchell Jr. admitted recently.

The branches close at 3 p.m., and documents from the big cities reach Crocker's data centers early.

"But wide-ranging areas like Eureka in the north or San Diego in the south don't reach us till 10 at night. All must be integrated, validated, processed, digested and ready for shipment back to the branches by 6 a.m.," Mitchell went on.

To cope with this and other internal bank DP chores, Crocker has two data centers, one here and one in Los Angeles. There is a Burroughs B4700 and a B3500 mainframe in each center.

But there's more, much more.

The Los Angeles center also has two IBM 370/155s. San Francisco has a pair of 158s, a 155 and a 360/30. Coming in in the next couple of months is one 168 and by mid-1975 Crocker will have a second.

These will replace some of the 155s, but Crocker is keeping the 158s and moving from OS/MVT to OS/VS2.

The bank has some 900 people working in data processing, about 150 of whom are in the program development and maintenance area, Mitchell noted. Crocker has standardized on ANS Cobol.

Not Fast Enough

The mainframes themselves have been able to do the necessary computations on a timely basis but the fastest printer Crocker could get from IBM is the 3211, rated at 2,000 line/min, and that wasn't good enough. The bank moved some of its more voluminous reports to a computer output microfiche (COM) unit, a Kodak COM-80.

Many applications, however, were not appropriate for COM, and Mitchell wanted to see something that would produce hard-copy paper image and that would improve on the speed of line printers so the work could be done on time.

For about two years, Crocker had been talking with Xerox to help the manufacturer understand what might be good marketing devices. These talks led to the development of Xerox's Computer Form Printer (CFP) and Crocker brought two of these systems into its centers.

CFP is an off-line device that uses a conventionally prepared computer generated report as input, and creates copies on 8-1/2 in. by 11 in. paper as output. It showed sharp improvements in speed compared with a line printer and, important to the trust department in particular, it improved the quality of the output. This was important, Mitchell noted, because a lot of the output for trust is seen by the bank customer.

CFP provided original document quality for each document produced, and it included a forms overlay facility so that custom preprinting could be included with live data from the computer. But the fanfold input proved troublesome.

Xerox 1200 Introduced

Crocker had two CFPs for about six or nine months, then the Xerox 1200 came along, "and that had real appeal for us," Mitchell said. The 1200 makes 8-1/2 in. by 11 in. page copies right from magnetic tape, and there is the possibility that both the COM unit and the Xerox 1200 can use the same print tape.

One 1200 has been in use for about a month and a half.

"We're just very pleased with it. It's so seldom we find anything that pleases both the operations staff and the end users. Sometimes we can't please either," Mitchell – Crocker's DP equipment coordinator – noted with a sigh.

The new xerographic print system has had such a favorable reception, he added, that Crocker is now trying to move all applications off the one remaining CFP and is planning to get a second 1200 for the data center here. And "because we want to maintain systematic, standardized approaches in all our work, we expect to get another [1200] for Los Angeles," Mitchell said.

Despite use of such innovative output devices, Crocker still has a "horrendous amount" of conventional line printing, and Mitchell does not think the bank will ever move all output to COM or the 1200. COM will remain a mainstay, since it produces reports at an effective rate of 30,000 line/min.

The 1200 goes at 4,000 line/min, certainly slower than the COM, but twice as fast as the 3211 line printer.

Looking At New Printer

The bank "is looking at" the new Honeywell page printer [CW, May 1] since that unit is said to generate 18,000 line/min on the large configuration, or 14,000 line/min with the smaller one. Like the 1200, it too is a nonimpact printer, using electrostatic rather than xerographic reproduction techniques.

Crocker apparently will be the first bank in the country to bring up the IBM 3600 series of financial terminals. Mitchell noted the target date for a pilot study, involving on-line teller terminals and not the unmanned units for customer use, is the last quarter of the year.

The bank is moving several applications on-line under IMS. Payroll (for bank employees) is already up; commercial loans is already being developed.

"A number of other major bank applications" will be shifted as they come up for reevaluation or major reworking, Mitchell said.

Thus far, however, there has been no move to handle Micr documents on a remote basis, which might eliminate what Mitchell freely describes as the "enormous" courier service the bank now maintains, and get the data to the centers earlier than is now possible with the physical transportation of the documents.

No Interface Problems

There are no interface problems between the Burroughs and IBM mainframes or the mainframes and the COM and 1200 units, partly because the Burroughs CPUs are dedicated to demand deposit accounting (DDA) (checking accounts). Crocker simply does not run any other applications on that equipment. And any DDA information needed by other applications is on tapes that can be read by the IBM gear.

The COM and 1200 are each operated off-line, so they have no direct linkage with the mainframes, Mitchell noted.

Cash Dispenser Reaction Mixed

(Continued from Page S/6)

gers most of the automated tellers. Keying in the code rapidly was another problem, BMA found.

"It's hard to use the machine, especially for older people," an Ohio resident said. "I am always forgetting my code number and I'm afraid of making mistakes."

Some of the automated tellers retain the user's card if he or she fails to enter the right code (usually a three-digit number) within a limited number of tries. That clearly upset some of the BMA respondents.

"The machine ate up my husband's card," a Stockton woman said. "He tried four different numbers, then it took the card away. He was frightened, mad and felt rejected."

Reservation on Deposits

Though many machine manufacturers are now enhancing their units with deposit capabilities, customers two years ago certainly had reservations about that possibility.

A Columbian who said she was a frequent user of the machines put it this way, "The machine is fantastic, great. I've even shown it to my friends. I use it for withdrawing savings, Master Charges, check cashing. [But] I have no confidence in the machine to receive my money. I would rather use the night depository."

Slow processing of deposits made at off-line automated tellers was an irritation to several users BMA contacted.

The bank money machine produces a variety of reactions of pleasure and complaint, often depending on whether the user is putting something into the machine, or getting something from it, BMA noted in summary.

The user puts into the machine his identification number, his card, his intelligence and manual dexterity, his funds for deposit or loan payment, the association report went on. As a taker, the machine can be seen as a strict disciplinarian, even a punishing, depriving monster that can eat things and take things away.

Then its complexity and impersonality demean and anger the user, BMA added. And that, implicitly, is the major problem the banks and the equipment vendors face in trying to improve man's interface with the money machine.

Bank Equipment in 'Evolution'

(Continued from Page S/7)

keyboard and a means of presenting data to the sales clerk.

A number of techniques, all mutually incompatible, are in use to record the account numbers of credit cards, Tanner added, citing magnetic stripes, embossing, punched holes, magnetic tracks and optical codes.

'Negative' or 'Positive'

The data base for credit authorization can be stored in a small, special purpose controller, a minicomputer within the individual authorization unit or in the general-purpose mainframe to which the devices are linked. The size and sophistication of the checking will vary with the system, but all files are either "negative" or "positive," Datapro noted.

Negative files contain information about lost or stolen cards and about accounts with payments long overdue. Basically, if an authorization request matches an account number of this type of file, the request is denied.

A positive approach, on the other hand, provides information about every account. The move toward large data bases serving multiple banks, groups of stores or national credit card companies makes positive checking more desirable – if not essential – in the future, the report speculated.

These credit authorization systems can be expected to evolve into the key hardware components of EFTS of the future, Darapro mused, before providing a comparison chart of 13 stand-alone systems designed specifically for credit checking.

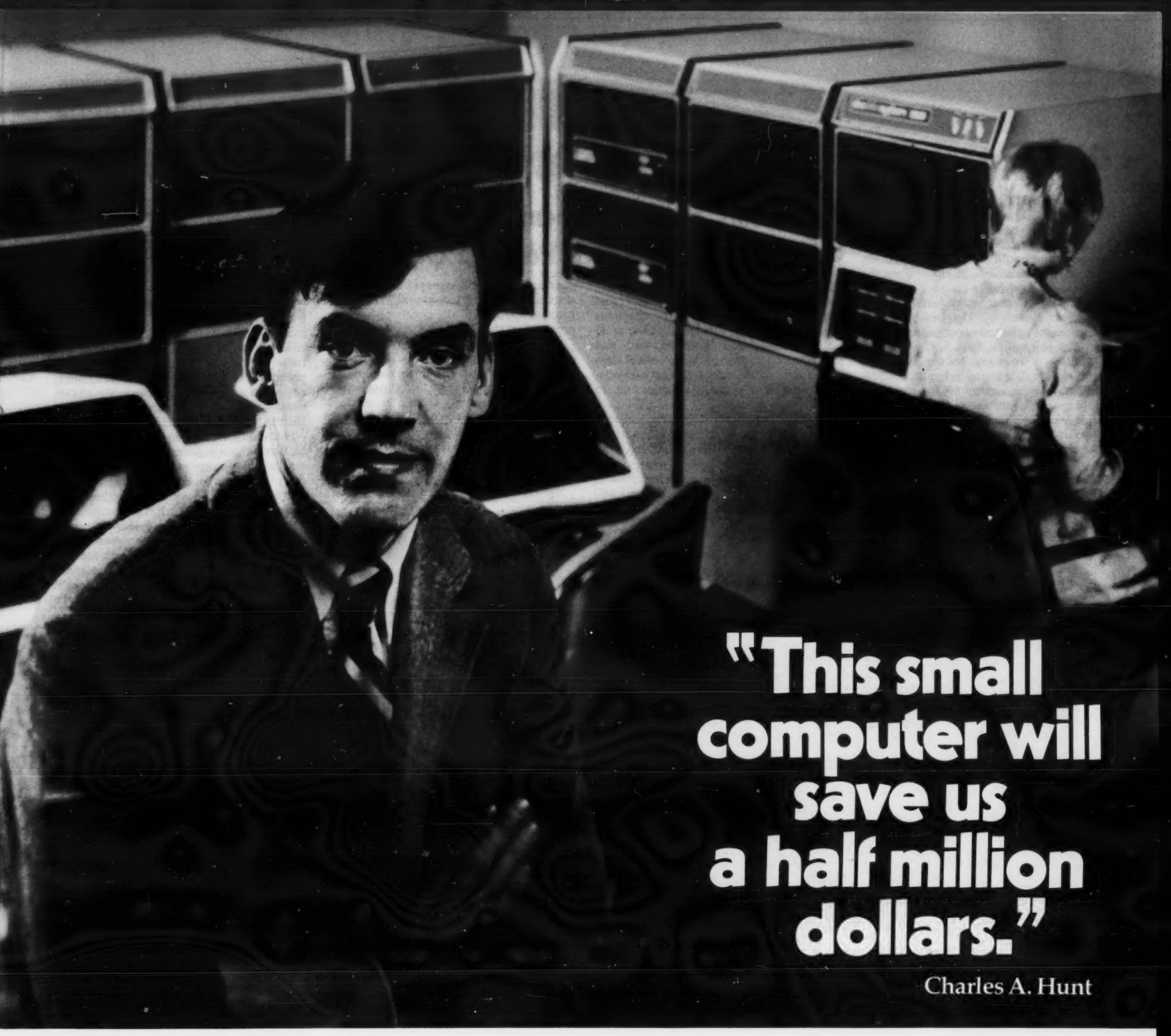
The Datapro "Reports on Banking Automation" also includes a section on application software available from a variety of sources for use in banks with a range of different mainframes installed.

The loose-leaf report is updated bimonthly with new pages, and monthly by a newsletter, which is also available to nonsubscribers.

MUTT AND JEFF
Created by Bud Fisher
MY UNCLE OPENED A SELF-SERVICE BANK! HE BELIEVED IN TRUSTING PEOPLE!
A SELF-SERVICE BANK?
YEH, IT HAD TWO BIG DRAWERS FULL OF MONEY! ONE MARKED DEPOSITS AND THE OTHER WITHDRAWALS!
NO WAITING! YOU FILLED OUT A SLIP AND PUT IN OR TOOK OUT WHATEVER YOU NEEDED!
YOU MEAN PEOPLE HELPED THEMSELVES?
AND HOW! THE BANK CLOSED THE NEXT DAY!
6-8
AL SMITH

(Copyright McNaught Syndicate)

EFTS (of sorts) has already reached the comic strips; it will become an everyday fact of real life before long, industry spokesmen and observers agree.



"This small computer will save us a half million dollars."

Charles A. Hunt

Charles A. Hunt
Assistant Vice President
Management Science Department
National Shawmut Bank
Boston, Massachusetts

"Before we installed the DEC DATASYSTEM computer, our annual timesharing expense exceeded $180,000. By comparison, the new, small computer represents a one-time capital investment of $160,000, but our net cost will amount to only $42,000 a year when the system is fully depreciated.

"This means that the DEC DATASYSTEM will effect projected savings of half a million dollars over the next five years based on timesharing costs at their present level.

"We're using the DEC DATASYSTEM to systematically apply mathematical and other analytical tools to banking problems. Included in our operations are unique solutions that embrace portfolio pricing, five-year bank forecasting, personnel management information systems, branch-bank location analysis, and corporate financial planning.

"Although the DEC DATASYSTEM can accommodate 32 users simultaneously on 32 different terminals, we presently have only 10 terminals deployed throughout the main bank and nine terminals in customer locations to whom we sell some financial planning and analysis services.

"We expect, however, to eventually add timesharing terminals to service other banks of the multi-bank association of which Shawmut is a member. They'll buy time from us on an as-needed basis for just a few dollars an hour using remote terminals.

"Since this will be a revenue producer for us, our half million dollar savings could be even greater. And that's a lot to say about a computer that's costing us only $42,000 a year."

digital

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Digital Equipment Corporation
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BAI Researching Micr Problems, Future of Minis

● Problems of Reject Reentry Studied
● Alternatives to Check Return Explored

PARK RIDGE, Ill. – The Bank Administration Institute (BAI), long the citadel of continuing education for bankers, is currently sponsoring a series of research projects that could have more impact on the banking scene than all the courses the institute has ever run.

Several of the current projects relate to problems caused by the heavy use of magnetic ink character recognition (Micr) encoding in banking.

Another is focusing on the future of minis and small systems in banks, and still another uses a computer to develop a profile – in terms of various operating ratios – on an effectively run bank.

Micr is very possibly the most common data entry medium in use today in terms of number of items processed. Check volumes are higher than ever and still growing.

When it works, it's great.

When the Micr encoding is not machine-readable, however, the check is rejected and it drops into one of the most labor-intensive, and therefore slow and expensive operations in the whole of data processing – the reject reentry cycle. That operation is the subject of one of the BAI task forces.

Another problem area, paradoxically, is the sheer number of checks that are successfully processed through the Micr reader/sorters.

Do they really have to be physically transported back to the signer's bank and ultimately to the signer in a monthly statement? Or are techniques available to provide a record of the check without the presence of the check itself?

An organized attack on the reject processing problem began a year or more ago.

Partly as a result of his work on phase I of this project, Charles R. Clung, president of Datavision Associates, Inc. of Boston, recently voiced pessimism that any currently available techniques can handle the job.

Acceptance in Stages

Nonetheless, a task group has been formed as an arm of BAI's exception item task force to carry phase I somewhat further. The mandate for this new group, chaired by Richard Buckwalter of Wells Fargo Bank, is to gather whatever facts are available on currently operating reject handling systems.

Working with Virgil Disney, director of BAI's research division, Buckwalter's group will meet at least once a month to construct a matrix of information about these existing techniques. It is also supposed to tell whether, in its judgment, any of the current technologies available can be deemed a cost-effective solution to the problem.

The group's first report is supposed to be filed in late September.

Admitting that such a schedule will push the group, Disney countered, "If there is a solution already out there, the sooner we know about it, the better."

Buckwalter seemed pleased with the support he has gotten from across the country. Even with backing by large and small banks, the work "won't necessarily go into great depth, but it will be enough to give a general overview of all the systems," he said.

"It will not be a systems-type study of every method or system that we identify," he added, "but it will produce a useful report. It probably won't please everyone, but it will come a lot closer to the problem than we've been up to this point."

"There, on the front of the [checking account] statement, were miniature, digitized images of the account holder's checks for the month, clear enough so the signature, and even the Micr stripe, could be read quite easily . . . On the back of the statement were the backs of the checks, properly aligned with the front images."

Buckwalter stressed the idea that whatever his group does, "it is just the beginning" of serious study of the problem.

Another task group just getting under way will be looking at the problem from the machine outward. Some unreadable conditions are hardware problems, and techniques to study how these conditions can be avoided will undoubtedly be a part of this group's agenda.

The group focusing on the return (or more logically, the nonreturn) of checks to the originator is likewise just in its formative stage.

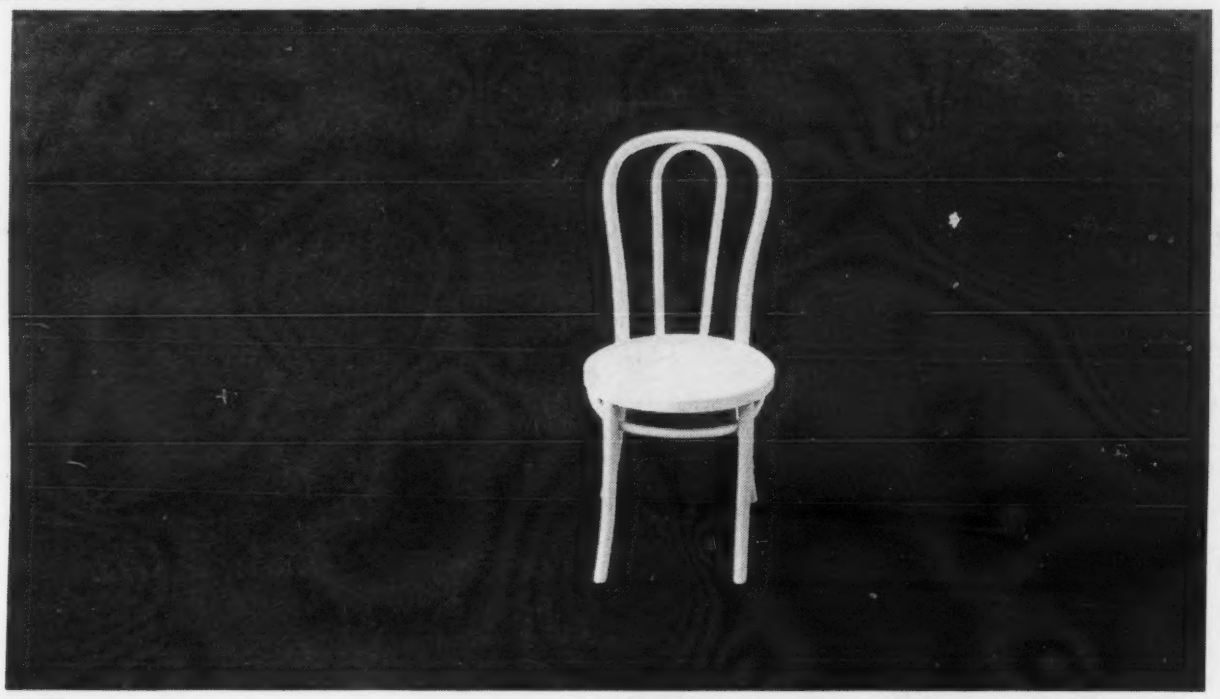
The questions it faces are immense, ranging from legal questions relevant to our accustomed use of cancelled checks as receipts to mechanical questions of how to capture an image of the check so the image can be passed on to the originator for record purposes.

Answer To Questions

One vendor at the recent American Bankers Association automation conference in San Francisco had at least a mock-up of an answer to many of these "return" questions. Recognition Equipment, Inc. showed a checking account statement that was reasonably conventional, until you looked at the bottom of the sheet.

There, on the front of the statement, were miniature, digitized images of the account holder's checks for the month, clear enough so the signature, and even the Micr stripe, could be read quite easily.

On the back of the statement were the backs of the checks, properly aligned with the front images and clear enough to showsmuch of the stamped endorsing that is so vital in tracking a check that hasn't been properly posted by the recipient.



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Manpower Program Links Training, Career Growth

• Career Paths Identified • DP Education Plan Implemented

By Edwin F. Kerr and
Gene M. Theoharous
Special to Computerworld

The State Street Bank and Trust Company of Boston employs some 400 people in data processing. Early in 1973 the bank decided to initiate a manpower development program for the planning and development department.

This department is made up of four subdepartments:

- Systems development, for analysis, design and implementation of DP systems.
- Systems programming, for maintenance of system software, coordination of testing and debugging activities, hardware performance measurement and evaluation, and DP training and manpower development.
- Information systems, principally for planning and development of systems using communications software.
- Methods consulting, for analysis and design of new or revised manual systems as well as the manual aspects of automated systems.

The department has 65 staff members and managers.

The bank asked QED Information Sciences, Inc. to help build and control a professional career program.

QED's system links training to career development and provides the necessary information required to plan, control and implement a DP education program so as to develop DP personnel to meet the ever-changing requirements of systems development.

Evaluates the Organization

To do this effectively, QED reviews and evaluates the organization, its structure, the hardware/software environment, standards, long-range plans, the job functions for each position and the present skills of each staff member.

A three-month effort results in:

- Position descriptions for each job classification.
- Identification of career-path progressions for each level linked to recommended training modules.
- A complete DP training curriculum for technical supervisory and managerial, communications skill, and application-related courses.
- Individualized training plans for each staff member.
- A plan of action specifying how to establish the program, manage and budget for its implementation.

A steering committee was organized with the power to review and approve the results of the project. It was made up of the manager of planning and development and the four managers reporting to him.

One of the first decisions of the committee was to select a full-time training director to implement the training program that would be developed. A member of the planning and development department, who in the past had shown both an interest and an aptitude in this field was selected and made a member of the team that was to implement the project.

The rest of the project team included a staff member from the organization and personnel training department; a member of the steering committee whose duties were to coordinate the project, set up schedules, arrange meetings and assure that all personnel involved were available as required; and the authors.

It was not required that anyone spend full time on the project. All staff members of planning and development were told about the project at a formal presentation handled jointly by the bank and QED.

Its major purpose was to make sure everyone understood the purpose of the project and the part each staff member would play. The bank felt this was absolutely essential to the project's success.

Using detailed job analysis forms supplied by QED that list detailed tasks, knowledge and skills, a complete analysis of all the positions was performed. The forms covered systems analysis and design, programming and management and supervisory activities.

These forms were used by the task force. Each area involved in the project assigned one or two key managers to work with the task force to fill out the forms.

This required two to five half-day sessions, depending on the area and the number of job classifications.

The result was a profile defining what functions are performed for each job classification in the DP department.

A coding system was used that indicated not only what tasks, knowledge and skills were required at various job levels, but also individual supervisory and managerial responsibilities as well. Interviews were held with top and middle management to gather information about the organization, the systems development process, the environment, project management and control procedures, existing training programs, future plans and other pertinent information that impacts manpower development.

A "total curriculum" of courses for each job classification, supported by course descriptions, tied the educational process to career-growth and position descriptions. It includes the courses required by the bank, distributed by job levels.

The skills inventory data collection material supplied by QED was filled out by each staff member. The forms are designed so that the staff member fills out only what applies to him.

Each individual's supervisor reviewed the completed skills forms.

(Continued on Page S/14)

Rookie of the Year

Introduced to the financial community a little less than a year ago, the Diebold TABS Total Automatic Banking System has established a broad base of support among bankers because of its several unique features. □ One of these is a fully-programmable computer which displays customer transaction instructions on a CRT. It is programmable on-site. Accordingly, it affords the bank great flexibility and versatility by enabling it to change its transaction mix as conditions change. □ In addition, the Diebold TABS system has been engineered for on-line integration with the bank's main frame . . . is backed up with our full servicing capability. □ For our TABS system is not our first experience with computer technology. Our well-established DGM-320 Security Systems, for example, are controlled by a computer identical to the one in our TABS system, and are responsible for protecting billions of dollars in financial institutions and their branches. In addition, we have developed pneumatic tube systems that utilize computers for scheduling and traffic monitoring. □ The point is: should you and Diebold have occasion to work together, you can expect us to speak your language.

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In Survey of 300 Largest Banks

System Applications, Purchasing Practices Queried

By Robert Stern
Special to Computerworld

In a recent survey, we were looking for indications of banks' propensities to purchase software systems rather than develop them in-house. We were also trying to determine what applications are being actively worked on by banks and which ones are being scheduled.

We sought data, in other words, about the systems that were wearing out. We wanted to get indications of the banks that are prime prospects for purchasing packages and those that want to sell their systems.

We selected as our initial universe 300 of the 400 largest banks in the country and 20 foreign banks. A one-page questionnaire was distributed that provided data concerning what we considered to be the 16 primary banking applications.

Greater Than 50% Response

After receiving greater than 50% initial response, we started compiling the statistics. We determined that the returns maintained the same distribution in size of bank and location as our original universe, and therefore presented a representative picture.

Our first surprise was the larger than expected ratio of Burroughs users.

Hardware Supplier of Primary Computer	
IBM	67.8%
Burroughs	21.2
Honeywell	5.1
NCR	5.1
Other	.8

But we were taken more off guard by the overwhelming number of banks that remained operating under DOS regardless of upgrades to IBM 370 equipment.

Distribution of IBM Systems	
Hardware	Operating Systems
360 — 27.8%	DOS — 73.4%
370 — 72.2	OS — 26.6

The 16 applications used in our survey represented the most common, even though a few (security movement and control, and international) would only be applicable to the larger banks.

Banks did write in other applications of which they were particularly proud such as teleprocessing monitors and report generators. The distribution of the banks having systems currently automated was fairly predictable with the large-volume applications (demand deposit, savings and installment loans) leading the way.

% of Banks With System Currently Automated	
Demand deposit	98.3
Savings	96.6
Installment loans	94.9
Personnel and payroll	81.4
Proof and transit	76.3
Mortgage loans	72.9
Personal trust	69.5
General ledger	64.4
Corporate trust	57.6
Bank investments	50.8
Commercial loans	50.0
Credit cards	40.7
Central file	31.4
Pension funds	23.7
Security movement and control	6.8
International	3.4

Applications Developed

Also, as one might predict, the lower volume and more management-oriented applications were at the top of those currently under development. (We did not include an MIS application on our form for fear we might have to define it).

% of Banks With System Currently Under Development	
Central file	25.4
Commercial loan	22.0
General ledger	16.1
Mortgage loans	11.0
Demand deposit	10.2
Installment loans	10.2
Personal trust	10.2
Bank investments	8.5
Personnel and payroll	6.8
Savings	6.8
Corporate trust	5.9
Credit cards	5.1
Pension funds	5.1
International	3.4
Security movement and control	3.4

Early systems are being scheduled for revision and rewrite as banks continue to standardize toward a common language and replace sequential processing systems.

% of Banks With System Scheduled For Revision or Rewrite	
Installment loans	16.1
Demand deposit	15.3
Mortgage loans	8.5
Personal trust	6.8
Commercial loans	5.9
Savings	5.9
Bank investments	5.1
Proof and transit	5.1
General ledger	4.2
Corporate trust	3.4
Central file	2.5
Credit cards	2.5
Personnel and payroll	2.5
International	.8
Pension funds	0
Security movement and control	0

What is interesting, however, is the amount of emphasis being placed on the replacement of early high volume systems. When we combined the statistics covering systems currently under development and those scheduled, we found that installment loans and demand deposit trailed central file and commercial loans by only 2%.

There is almost the same effort being allocated to the replacement of old systems as to the implementation of new ones.

Our information on the ages of the currently automated systems provides support for the theory that these early systems are just not able to keep pace, and that banks are being forced to switch priorities from the implementation of management-type applications to replacing the systems that justified the original need for computers.

Age Distribution of Currently Automated Systems				
	LESS 1 YR	1 — 3 YRS	3 — 5 YRS	OVER 5 YRS
Demand deposit	10.3%	23.3%	25.9%	40.5%
Savings	5.9	31.4	36.3	26.4
Installment loans	11.7	34.2	26.1	27.9
Personnel and payroll	10.8	37.6	23.7	27.9
Mortgage loans	9.3	40.7	22.1	27.9
Credit cards	8.2	26.5	55.1	10.2
Corporate trust	14.1	39.1	28.1	18.7
Proof and transit	20.5	38.5	20.5	20.5
Personal trust	16.0	40.7	29.6	13.7
Bank investments	19.7	45.9	19.7	14.7
Security movement and control	25.0	37.5	25.0	12.5
Pension funds	21.4	46.4	25.0	7.2
Commercial loans	25.4	52.5	11.9	10.2
Central file	25.6	48.7	20.5	5.2
General ledger	29.9	48.1	16.9	5.2
International	25.0	75.0	0	0

Another interesting observation is that personnel and payroll appeared fourth when ranking the applications by age, but unlike other early systems that are being replaced, ranked 13th of those scheduled for revision or rewrite.

More Purchased Packages

A look at the source of the systems within each bank substantiated our theory that banks were obtaining more and more of their systems as purchased packages. The large-volume systems that were the first to be implemented were, for the most part, obtained through in-house development, while the less critical applications were sought from outside sources.

It is interesting to note that of the demand deposit and savings packages that were purchased, the vast majority were implemented within the last three years.

Source of System		
	Devel. In-house	Purch. Package
General ledger	26.6%	73.4%
Commercial loans	29.2	70.8
Personal trust	38.6	61.4
Credit cards	39.2	60.8
Corporate trust	41.2	58.8
Personnel and payroll	43.6	56.4
Central file	45.4	54.6
Bank investments	53.8	46.2
Security movement and control	54.5	45.2
Mortgage loans	57.5	42.5
Proof and transit	58.6	41.4
Installment loans	62.9	37.1
Pension funds	65.6	34.4
Savings	70.6	29.4
Demand deposit	73.3	26.7
International	100.0	0

Banks purchase systems from two primary sources: vendors (including manufacturers) and other banks. Of all the systems purchased from other banks, personal trust, credit cards and mortgage loans head the list.

Distribution of Systems Purchased From Other Banks	
Personal trust	14.3%
Credit cards	12.5
Corporate trust	10.6
Mortgage loans	10.0
Bank investments	9.4
General ledger	8.8
Installment loans	6.3
Commercial loans	5.6
Demand deposit	5.6
Savings	5.6
Proof and transit	5.0
Personnel and payroll	2.5
Central file	1.9
Pension funds	1.9
International	0
Security movement and control	0

From vendors, more personnel and payroll, commercial loans and general ledger systems were purchased than any other.

Origin of Purchase

We found nothing significant in the supporting detail that would indicate why banks purchase from vendors rather than other banks, or other banks rather than vendors.

Distribution of Systems Purchased From Vendors	
Personnel and payroll	13.1%
Commercial loans	11.2
General ledger	10.9
Installment loans	8.0
Personal trust	7.5
Proof and transit	7.5
Central file	7.2
Demand deposit	6.4
Corporate trust	6.1
Savings	6.1
Mortgage loans	5.6
Bank investments	4.0
Credit cards	2.9
Pension funds	2.1
Security movement and control	1.4
International	0

We had felt that we might see a trend that banks were more willing to purchase certain systems from other banks due to the complicated nature of the application or other systems might consistently be purchased from vendors due to the need for greater support.

After reviewing the data, we found no such trends. Purchases seem to be made based on availability of systems and the amount of active marketing performed.

Our survey pointed out areas that require more investigation and more data. On-line systems, data base management and other generalized software seem to be having a significant effect on bank automation.

As we broaden our information, we will be looking at these areas and increasing our universe by polling the next 300 largest banks. From our data to date, we expect to see that the smaller banks rely even more heavily on the purchase of packages, but still have to face a substantial expenditure of time and money in necessary modifications.

We estimate almost $50 million was spent by the banks that answered our questionnaire for the purchase of application software, and an equal amount was spent on required modifications and implementation. That was still only 20% of what it would have cost to develop the systems in-house.

As a result of our survey, we were able to isolate many banks that would like to sell their systems and sent them a system information form (one-page form designed to capture information significant to potential purchasers) for each salable application. We have received over 50 completed forms thus far and are now in a position to make this data available to inquiring banks.

Robert Stern is president of Penser, Ltd., 21 Bayview Ave., Port Washington, N.Y. 11050.

Training, Career Paths Linked

(Continued from Page S/13)

The results from each employee were matched against the requirement indicated by the job-analysis forms for the appropriate job classification.

If the individual did not have sufficient knowledge or skill to match the skill required, this fact was recorded on the individual's skills inventory form.

Using the posted skills inventory form, a training guide was developed for each individual.

For each course, a priority was assigned to indicate its significance. The priority may be modified in the future by the training department or the supervisor.

When the individual training guides were completed they were reviewed by the staff member and his manager. It was important that both agreed to the plan. The manager's support was absolutely essential to success of the training function.

Upon acceptance of the individual training plans, the data for each individual was summarized to identify the education requirements by course module and priority.

The information was used to develop a training plan that identified specific action items, training alternatives, priorities and budgets. This plan has provided the necessary information to plan, implement and control the DP education and training program.

The maintenance of the system is an on-going task. New employees are required to fill out the skills inventory forms so that a training guide can be created for them. The individual training guides will be kept current by entering course attendance and relevant remarks.

Edwin F. Kerr is executive vice president of QED Information Sciences, Inc., 170 Worcester Road, Wellesley Hills, Mass. 02181. Gene Theoharous is assistant vice-president and manager of long-range planning for the computer services division of State Street Bank and Trust Co.

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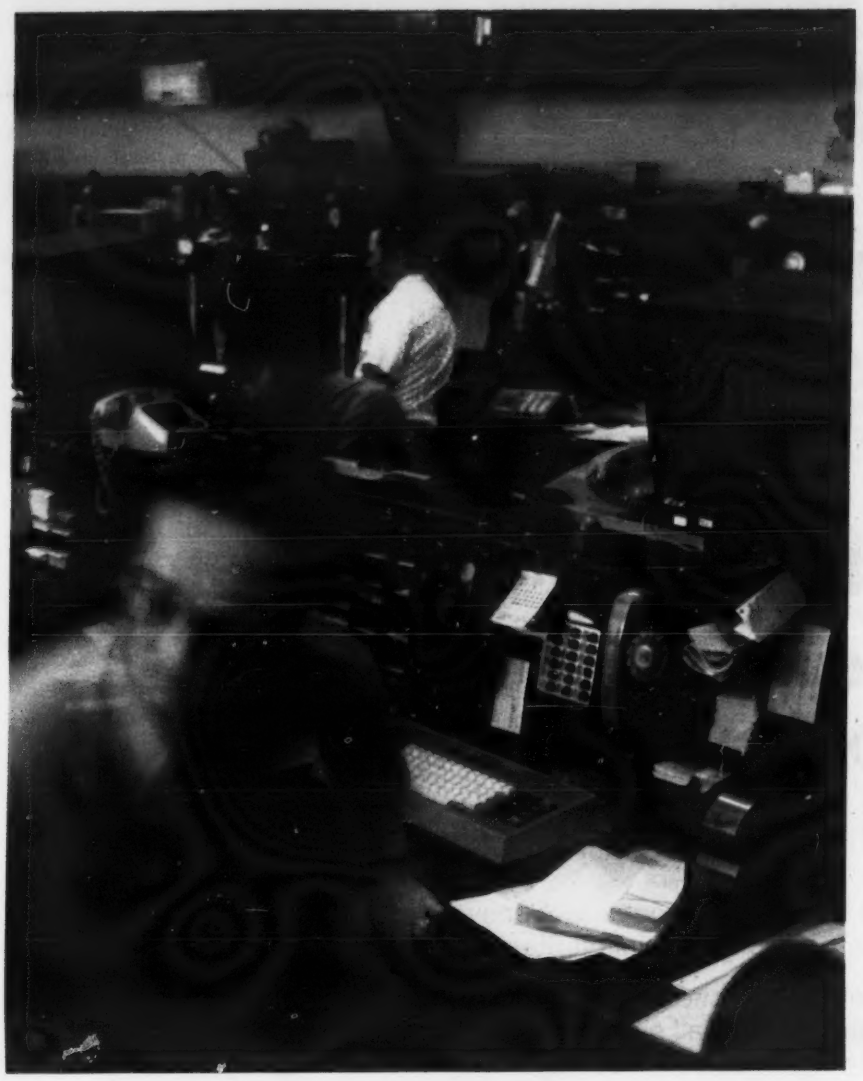

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After 15 Years of Project Potomac

Patent Office Finds Search System Patently Unusable

By Jerry Cohen
Special to Computerworld

The U.S. Patent Office, custodian of one of the world's largest technical data bases, quietly shelved 15 years of effort to automate its searching processes with a decision to discontinue Project Potomac (Patent Office Techniques of Mechanized Access and Classification).

The National Bureau of Standards (NBS) and Mitre Corp., providing an objective overview of the Patent Office efforts, concluded that Potomac "did not significantly advance the Patent Office on its way to automation" and criticized Potomac for:

- System development by accretion, necessarily leading to confusion.
- Diffusion of project responsibility.
- Lack of a unified integrated statement of the planned system.

Claims Search

The Patent Office has among its many jobs the task of evaluating claims of every new patent application – 100,000 a year – against the entire body of prior art, including some 3.8 million prior U.S. patents, an equal number of foreign patents and the large body of nonpatent literature in the U.S. and abroad.

The texts of prior U.S. patents vary from detailed expositions to vague evocations of the blue sky, and the applications have a similar variance of content.

The reference patents and/or the application may consist of straight text or may also comprise drawings, tables, equations and/or chemical formulas.

The present data base of 20 million prior art patents and other documents is divided into some 400 classes, each of which is further broken down into 100 to 200 subclasses.

An examiner digests the subject matter of an application and decides which of the subclasses constitute appropriate searching fields and scans the U.S. patents arranged chronologically in those subclass files. These green eyeshade methods have changed very little since the Civil War, but examiners say they have worked reasonably well (i.e. they can find the prior art).

New prior art cited against a patent after its issuance is often of a nature (e.g. unpublished commercial use) that it would not get into a data base, and therefore no amount of Patent Office automation would have brought it to the examiner's attention.

Inadequacy Cited

One area where the examiners concede the inadequacy of present classification and retrieval methods is in examining patents for digital computer hardware and, until the *Benson-Tabbott* decision, for software.

Project Potomac had four major goals:

- Demonstration of computer-aided retrieval and query language – completed one year late.
- Demonstration of computer-aided classification techniques – terminated.
- Mass memory procurement in June of 1972 – never begun.
- System procurement in July of 1972 – never begun.

Development of a query language and prototype operational system was contracted to Mitre Corp. which demonstrated a prototype system in December of 1972. The contractor developed a language which allowed interactive full-text searching, but revealed immediate vulnerabilities of generating need for high storage capacity and having low flexibility.

The computer-aided classification contractor, GEI, Inc., Burlington, Mass., conducted experiments on a selected algorithm for a statistical clustering of like or unlike terms in patent texts, and completed experimental design of the selected algorithm by the end of 1971. The project was then mothballed.

Procurement of a patent image retrieval system was never implemented. The Patent Office estimated the cost at $3 million for an Ampex video file system with 56 terminals mounting a maximum of seven tapes at once for on-line access to 140,000 to 180,000 patents, with an average retrieval time of 1 to 1.3 minutes (assuming no delays or queues).

Digital Stores Evaluated

The Patent Office evaluated mass digital stores affording the necessary trillion bit basic storage module capacity, including the Ampex TBM, CDC Scroll and Grumman Masstape. IBM Chip Store and Unicom 690 were dropped from consideration when the Patent Office learned the vendors had dropped or replaced these lines.

Data base conversion for OCR turned into a cost nightmare for the developers. A cost of $27 million for keypunching a million patents was projected. But costs of converting new patents as they issue are averaging $58 each, and Potomac found a history of $85 per patent unit, the cost for retrospective conversion.

The NBS overview closed with a recommendation for decentralized automation, with line managers in the patent examining corps being encouraged to accept responsibility, development of diverse systems to meet diverse examining problems in different branches of the prior art, and working further back from the forefront of mass storage and retrieval technology.

NBS also recommended a continued collection of U.S. patents in machine-readable form and expanded efforts to index prior art.

Data Network Monitors Sweden's Power Grid

STOCKHOLM, Sweden – The National Swedish Power Administration is setting up a totally integrated data system for the minute-to-minute supervision of Sweden's power grid, at a cost of $18 million.

The system will consist of two main parts. The first will consist of two Xerox computers; the second of 22 small computers and some 100 terminals, supplied by ASEA-LME Automation of Sweden, which will form a communications network.

Incoming data from the grid, which is scheduled to begin operation in 1975, will be analyzed and stored in a central control room here.

The computer will notify the staff of any malfunctions and provide them with instructions to set right the fault.

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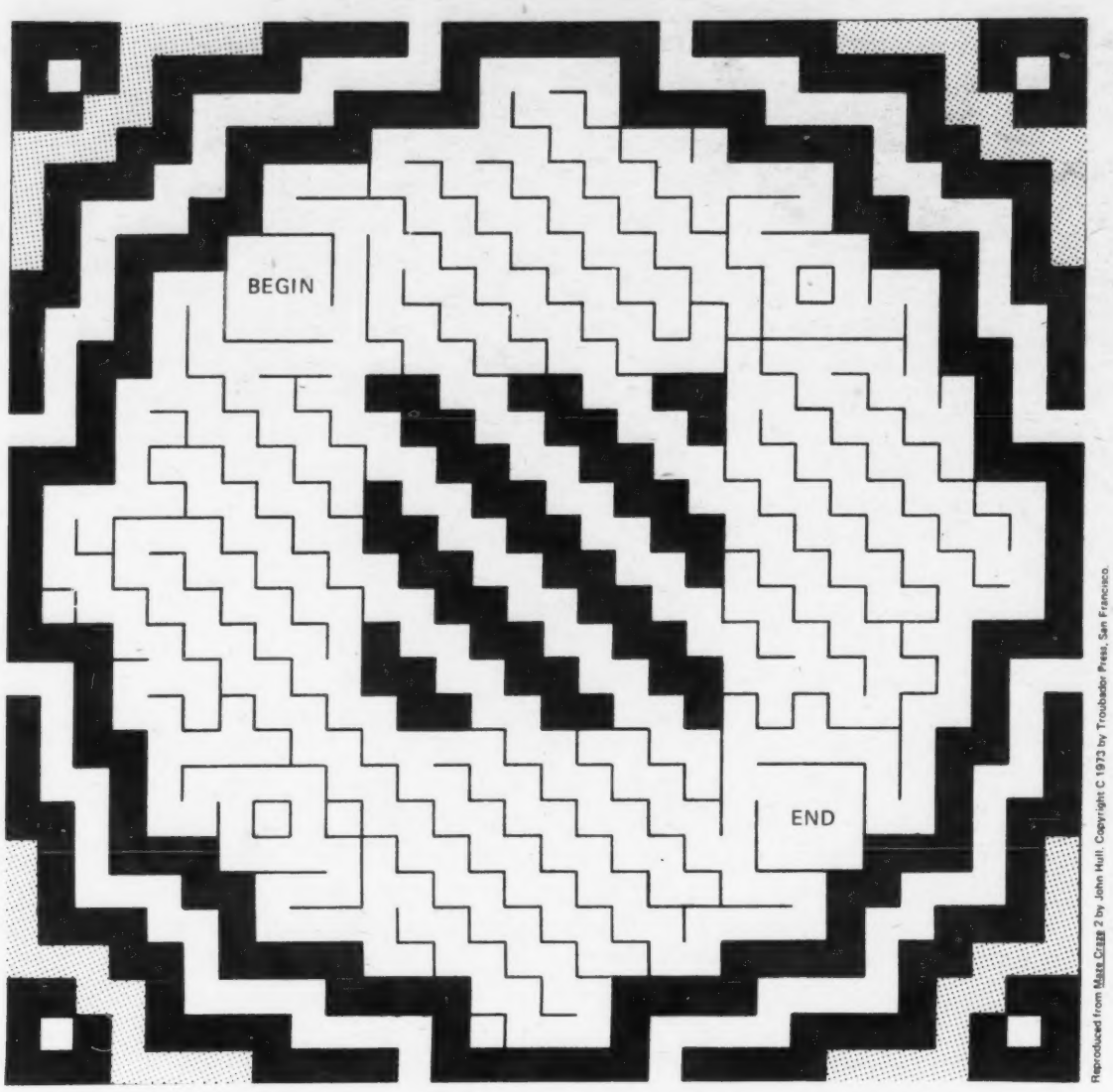

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'Fired' Doctor Gets Contract From Computer

TUCSON, Ariz. – When University of Arizona administrators were firing Dr. Erle E. Peacock Jr. last spring as surgery chief at the school's College of Medicine, they forgot to tell the DP department, and it's caused headaches ever since.

The forgetfulness made the discharge "a much more extended and difficult process than it would have been," according to special assistant attorney general William R. Jones Jr., who is representing the university.

In April or May 1973, the university administrators decided Peacock would not be reappointed head of the department and "had some discussions with him asking that he resign," Jones explained.

At this same time of year, the medical college's DP center prints up the contracts for professors.

"What happened was that somebody forgot to tell the computer not to print the contract," Jones recalled. The system did print the contract and it was mailed to Peacock, who signed it and sent it back.

In spite of that, the university went ahead and discharged Peacock in October 1973, Jones said, "and then we got sued."

In an opinion last month, a U.S. District Court judge ruled that "you can't do that without giving him a hearing beforehand, because he's got this contract," Jones related.

An academic committee will now weigh Peacock's case.

Peacock, who had taught at the medical college for five years and had full tenure, saw the case a bit differently. The university had tried to explain its legal defeat to the public simply by blaming it on a "computer mistake," Peacock mentioned, but the school hadn't followed due process either.

Scotland Yard to Get Computer Crime Net

LONDON – Scotland Yard and other British police units soon will have a computerized law enforcement network at their disposal, patterned after systems developed by police agencies in the U.S.

The new National Police Computer Network is designed to allow police agencies to track vehicles and criminals and to provide instant information on wanted and missing persons and the records of convicted criminals.

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System/7 Monitors Electricity Demand at University

By Nancy French
Of the CW Staff

CARBONDALE, Ill. – Like everyone else, Southern Illinois University is paying more for energy now, but like few others, they've found a way to use less – through a system known as power demand control.

Since last January when the university put an IBM System/7 in charge of monitoring its power demand and then controlling the demand when it began to exceed a predetermined maximum level, the university has saved $26,017 in electric bills alone.

SIU officials expect savings to drop during the summer months, but Thomas Engram, SIU's electrical engineer responsible for planning and development, said he anticipates additional savings of around $18,000 to $20,000 from September through December, for a year-end total savings of $52,000 to $56,000.

Engram described the system:

"Our electric bill, like that of most industrial users, has two components: first, the demand charge, stated in kilowatts, and second, the total energy charge, stated in kilowatt hours. Theoretically, the demand charge is based on the cost to the power company of providing all the equipment necessary to handle the maximum demand of all its customers at any given time.

"The cost of these additional facilities, standing by for maximum demand, is passed on to the users in the form of demand charges," he explained.

"The power company meters our demand and charges us a rate based on the number of kilowatts consumed in the peak fifteen minute period of each month," he said.

'We Measure Demand'

"So what we do is measure our demand the same way the power company does, and when our demand begins to go above the predetermined maximum standard we set at the beginning of each month, we shut off as many fans as necessary to reduce the peak demand," he explained.

This is okay, according to Engram, who cited a power demand analysis showing that during the winter cycle, certain heating, ventilation and air conditioning (HVAC) systems can be switched off for periods ranging from 18- to 25 minutes with no discomfort to room occupants. The report also showed that switching the system off during the heating cycle does not upset the central steam plant operation.

Since all HVAC fans of 10 horsepower and over in eight of the campus' major buildings were already connected to the central campus utility control system, they merely empowered the System/7 to take control away from the central panel operator whenever peak demand is to be exceeded and turn off three pieces of equipment.

"It takes approximately 30 seconds for the computer to access the dial system and turn off three fans. If the demand meter reading continues to rise in the next minute, it repeats the process again," he said.

Each time a device is turned off, the computer prints out its four-digit address and the time it occurs. After a predetermined interval, the device is turned back on.

kW List Printed

When the power company meter reader closes a signal switch at the end of the monthly billing period, the computer prints a list of the total kW turned off during the maximum demand period for that month. "It is from this list that we compute our actual kilowatt savings," Engram explained.

The interface and system debugging took about four to five weeks, according to Engram, and the most serious problem encountered with the actual interface and installation came about "because we used an existing (noncoaxial) control cable, installed six years previously, to carry the pulse signals from the substation power demand meter to the computer.

"The control line interface from the meter picked up stray signals which caused the computer kW count to vary from that of the power company's demand tape. We cleared this up by installing isolation relays on the computer end of the control cable," he said.

Engram pointed out, "This year's operation is only phase 1 of our plan for conservation of energy and dollars. In phase 2 we hope to program as many as 10 to 15 major buildings to night setback – using the computer to lower their temperature at night," he explained.

In phase 3, SIU plans to place its steam plant under complete control to increase efficiency.

"This year our coal cost has been around $10.50/ton," Engram explained. We expect next year's cost to reach around $19/ton," he said. "It's very important that we increase our plant efficiency."

Goals

Other future goals include bringing the campus' large refrigeration plants under computerized control and interfacing the System/7 with the campus IBM 360 to program auditoriums and large classrooms to an off-cycle for lighting and HVAC systems during unoccupied times during the day.

Ultimately, Engram plans to put at least one building under security surveillance, using the System/7 to cut down on equipment losses. "This is the only program planned which will not result in an energy savings," he said.

Engram cited two major reasons for selecting an IBM mini. First, he said they believed it would be easier to interface the System/7 with the 360 presently in use on campus. Second, they were impressed with the "outstanding performance record and quality of service" furnished by their local IBM representative. No other vendor has a service representative in residence in Carbondale, and Engram said this makes a big difference.

Engram urged companies interested in saving energy to do a comprehensive survey of size, type and location of building components before undertaking any conservation plan.

"It's very important to be familiar with the basic system characteristics of your heating and cooling systems and to know and understand the interrelationship of the various systems in the application of power demand control and energy conservation," he said.

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Woman Files Suit

'DP' Dating Bureau Promises Unfulfilled

By Nancy French
Of the CW Staff

ALBUQUERQUE, N.M. – A woman here has filed suit in district court against a "computer" dating service charging it did not deliver what it promised – companions carefully matched to her interests, age and lifestyle.

Barbara J. Yrene filed the complaint against International Computer Dating, Inc. and Associates Financial Services Co. of New Mexico, Inc., a Delaware corporation.

The company's new owner said at the time he bought International Computer Dating, the company wasn't even using a computer to match their clients.

The plaintiff said she responded last June to an advertisement in a local newspaper which read "Singles Call This Number." She called the computer dating service, and a few days later a representative came to her home.

The representative said if she would subscribe to the service, she would be scientifically matched with a "male companion of a social standing similar to her own." To assure this, the representative gave her an "IQ test" and asked her a lot of questions, she said.

98% Marriage Results

Yrene further stated the representative told her 98% of the cases they have handled resulted in marriage and only 2% of those marriages ended in divorce.

"The price was high, $395, but compared with the bar hopping scene, it seemed like an easy, clean way of meeting people," she said.

Signing a 36-month contract, she agreed to make payments through the finance company, which raised the cost to over $400.

No referrals were sent until September – three months later – "supposedly due to a fire in the computer in the Denver area," she said, and then she received only one call from a man who happened to be Black. "He was a member of a race I had indicated I did not wish to date or marry," she said.

Yrene said she received some other referrals later that fall, but none of them ever called her. When she attempted to call two of them, she found they "lived in a style similar to the hippie cult" and that their lifestyle deviated substantially from the information she furnished the computer service as a desirable social companion. "What's more, they lived 60 or 100 miles away, which wasn't very convenient for a dating relationship," she said.

Yrene said she went to her attorney in March.

"At the moment, the case is going very slowly," she said. "Computer Dating has answered the summons, and I guess it's our turn to set a time to go to court," she said.

When reached in his Denver office, Clifford Hastings, the present owner of International Computer Dating, Inc. explained, "I had absolutely nothing to do with that corporation until March 13 of this year when I purchased the stock. Barbara Yrene's case was prior to when I purchased the stock," he said.

"Her complaint could be justified – a great number of people down there did not receive the service and did not receive it in the right manner," he said. "From the complaint I saw, though, I'm sure she stretched a lot of points," he added.

"At the time I took over the people weren't even on a computer. Since I took over, I have put out letters to everyone that had the service, explaining the stock purchase.

"We physically went through every file jacket, made verifications of names, addresses and phone numbers so that when we did put them on [the computer] at least the people were going to get the proper service," he said.

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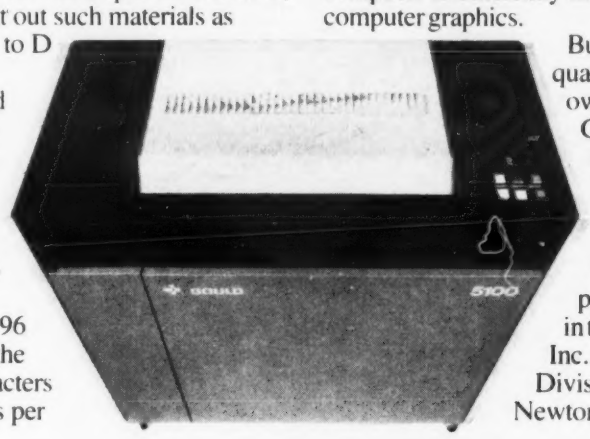

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Mini Monitors Jetport Noise

SAN DIEGO, Calif. – Four microphones high atop buildings and poles on the eastern approach to Lindbergh Field, and four others to the west, keep track of the noise jetliners make near this city's airport.

California law requires airports with "noise problems" – and that includes most of the state's major jetports – to do continuous monitoring, so a county could prosecute an offending airline, if necessary.

To meet this requirement, San Diego's airport has installed a computerized system in which analog signals from the microphones feed into an 8K Varian minicomputer in the office of aviation director M.A. McDonald.

Whenever an aircraft exceeds the noise level for that time of day, the system stores the sound and the time it occurred on tape along with the conversation between the pilot and the control tower.

The system also checks the remote monitor where there is a violation to make sure it is operating properly.

Every midnight, the system prints out an hourly noise summary and a calculated community noise level for the area around each remote site, plus a recapitulation of violations during that period.

On Info 74 Program

AMA Plans Sessions for DP Managers

NEW YORK – Info 74, sponsored by the American Management Association (AMA), has designed a new program for this year, with three quarters of the topics aimed at a management audience and the remaining quarter designed especially for DP management.

For managers who want an understanding of the fundamentals of information systems, the program, to be held Sept. 9-12, offers three intensive one-day courses: Basics in computer systems design and application, fundamentals of data communications and fundamentals of microform storage and retrieval.

For the DP manager, a program of both technological sessions and DP management sessions has been prepared. Concurrent sessions will be held in the areas of administrative services, manufacturing, retailing, marketing and sales, personnel, service organizations, financial, banking, insurance, hospitals and government DP.

VIP Sessions

AMA has also planned a series of VIP sessions by invitation only, designed for chairmen, presidents, vice-presidents and other top executives who make the final decisions on their companies' information systems, their applications and implementation.

The VIP sessions consist of four luncheon meetings, each four hours long, one session for each of four different groups of top-level executives. Each session examines the potential economic effects of one of the rapidly advancing technological areas.

Societies/User Groups

More than 140 companies have signed up to exhibit at Info 74, sponsors said.

Exhibiting companies include BASF Systems, Control Data Corp., Datapoint, Electronic Memories & Magnetics, General Computer Systems, Hewlett-Packard, Inforex, Sanders Data Systems, Texas Instruments and Tymshare, Inc., among others.

For further details contact Clapp & Poliak, Inc., Exposition Management, 245 Park Ave., New York, 10017.

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SPDP Joins Acpa

KENSINGTON, Md. – The Association of Computer Programmers and Analysts (Acpa) and the Society of Professional Data Processors (SPDP) have merged, with Acpa the continuing organization.

"Acpa and SPDP believe that the interests of both organizations and their members can best be served by a single larger, stronger and more active organization," according to Geoffrey Thomas, Acpa president and Ronald Stewart, SPDP president.

SPDP members will be offered membership privileges in Acpa with full recognition of length of membership, and will not be due for renewal until the end of their current SPDP membership period.

Thomas summed up the merger by saying, "We do not believe bigger means better, but we expect the whole to be greater than the sum of its parts – synergism at its best."

The merger became effective May 1.

Calendar

July 1-27, Hamilton, N.Y. – **Workshop in Computer Generated Music.** Contact: Department of Music, Colgate University, 13346.

July 9-11, Houston – **Summer Computer Simulation Conference.** Contact: Harvey Marks, Treasurer, SCSC, 7648 Capistrano Ave., Canoga Park, Calif. 91304.

July 10-12, San Francisco – **Optical Character Recognition Users Association Conference.** Contact: David McFarland, OCR Users Association, 505 Busse Highway, Park Ridge, Ill. 60068.

July 13-14, Boulder, Colo. – **Workshop in Interactive Computer Graphics,** sponsored by Siggraph. Contact: Robert Schiffman, Computing Center, University of Colorado, 80302.

July 18-19, Boulder, Colo. – **Twelfth Annual Computer Personnel Research Conference,** sponsored by SigCPR. Contact: Bureau of Conferences and Institutes, Academy 217, 970 Aurora Ave., University of Colorado, 80302.

July 29-Aug. 1, Jerusalem – **Second Jerusalem Conference on Information Technology.** Contact: Lester Dinoff, Computer Audit Systems, Inc., 725 Park Ave., East Orange, N.J. 07017

Aug. 12-14, Stockholm, Sweden – **Second International Conference on Computer Communications.** Contact: Edward E. Boyar, 1860 Wiehle Ave., Reston, Va. 22090.

Aug. 13-15, Bellingham, Wash. – **1974 Summer Adcis meeting.** Contact: Barbara Farquhar, Laboratory for Computer Science, Massachusetts General Hospital, Boston, Mass. 02114.

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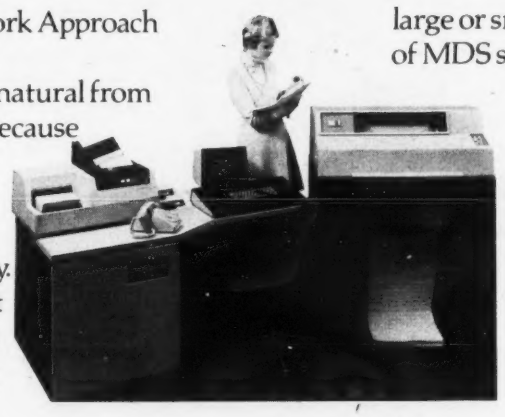

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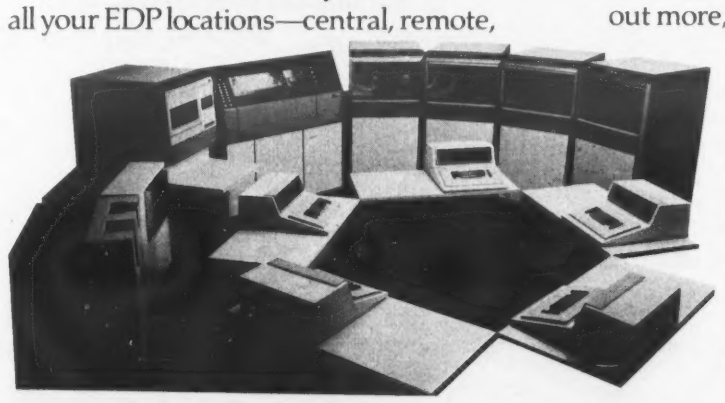

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National Bank of Birth Defects To Zero In on Patterns, Causes

By Toni Wiseman
Of the CW Staff

ATLANTA – Starting next October, medical officials faced with a sudden upsurge in the incidence of a particular birth defect will be able to turn to a computer data base to help identify the extent and possible cause.

The project's aim is to detect and follow up unusual patterns in the occurrence of birth defects, which may suggest environmental causes for such defects.

The need for this type of system, according to a Department of Health, Education and Welfare spokesman, has become more apparent as pregnant women are exposed to an increased number and variety of drugs and more environmental pollutants whose effects on the fetus are not always known.

Computers & Medicine

The program will monitor about 2 million of the 3.2 million births in the U.S. each year, with data input from some 1,500 hospitals across the nation.

HEW's National Institute of Child Health and Human Development (NICHD) will fund the monitoring program which will be directed by the Center for Disease Control (CDC) here. The National Foundation March of Dimes will provide additional funding and liaison work through its local chapters.

Data Analyzed

The nerve center of the operation is the Commission on Professional and Hospital Activities (CPHA), a private nonprofit health data computer center in Ann Arbor, Mich. CPHA's primary purpose is to analyze medical record data from its participating hospitals for use in the monitoring of medical care and in hospital planning.

About 42% of the nation's short-term general hospitals subscribe to CPHA's research program, the Professional Activity Study (PAS), which will provide the reporting vehicle and data base for the monitoring system.

The new program uses the existing CPHA data base, which includes several million abstracts of patient records, including eight million birth records, to establish norms against which new information will be compared, according to Dr. J. William Flynt, chief of the birth defects branch, bureau of epidemiology, CDC.

Hospital birth reports to CPHA include data on sex, race, date of delivery and discharge, alive or dead at discharge, diagnoses and birthweight.

Standard numerical codes are used for all items, thus patients remain identified by a hospital code number only.

Once baseline figures for birth defects are established (some time this summer), Flynt said, the computer will be ready to alert CDC whenever incoming reports show an unexpected increase, be it nationwide or by region, state, city or individual hospital.

When the computerized system indicates a problem – an unusual number of similar birth defects – CDC will evaluate available data and determine whether a follow-up should be conducted.

Doctor-patient confidentiality will be maintained and CDC representatives will make their inquiries only with the permission of physicians involved, an HEW spokesman said.

"I think this system would have spotted the increase in birth defects caused by thalidomide, but how quickly it would have identified the cause – that's a moot point," Flynt stated. "It's a problem of being able to ask the right questions."

Self-Taught Programmer Saves for Hospital

CORAL CABLES, Fla. – Take an associate hospital director, give him a couple of RPG II texts and you may end up saving time and money for your institution.

David Pomerance began using a System/3 Model 10 two years ago to handle billing, customer accounts and other administrative tasks at Abbey Hospital here.

All computer programs at the hospital were written by Pomerance, who learned programming from IBM texts and who had no previous operations or programming experience.

The operation increased total hospital cash flow $100,000 in its first year of operation, Pomerance stated.

Outlining just a few of the benefits derived from the operation, Pomerance said the hospital can now send out invoices every 15 days, rather than monthly; it has expanded from 23 to 53 beds with no clerical staff increase; and more and better management information is now available.

Future plans for the System/3 include a data base of patient records and the addition of CRTs.

Danger Signs Spotted By 'Infection Alert'

CLIFTON, N.J. – Computerization is the latest weapon in the fight against hospital-caused infection outbreaks.

Computerized collection and analysis of hospital data pinpoints clusters of infection with an apparent common cause, providing an early warning system which alerts hospitals to potential epidemics.

The service, offered by Bac-Data Medical Information Systems, Inc., uses data provided by the individual hospitals to compile twice-a-month "infection alert" reports on infection patterns in their own institutions. A nationwide pattern is also prepared so the individual hospital can compare its infection rate with the national norms, a company spokesman said.

Hospitals submit data on every test performed in the microbiology department, listing the type of bacteria found, location in body, what antibody was used and whether it was effective.

The data, which is entered on mark sense cards, also includes the age and sex of the patient and the ward he is in. This detailed information facilitates pinpointing the cause of the infection, such as a specific instrument in one ward.

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UCLA Biomedical Researchers Get a Good Dose of DP

LOS ANGELES – The UCLA Health Sciences Computing Facility here is working to bring biomedical researchers as close as possible to mathematics, statistics and computers without turning them into specialists in any of these fields.

Funded by the Biotechnology Resources Branch of the National Institutes of Health's Division of Research Resources, the computing facility seeks "to provide as many scientists as possible with varied types of computer support," according to a UCLA computing facility spokesman.

Assisting research in such diverse areas as radiation treatment planning for cancer, the search for genetic ties to autism and tissue typing for kidney transplants, the facility's staff furnishes "intensive consultation services in statistical analysis and programming," he said.

The infinite number of variables involved in human physiology, the constant need for integrated and automated approaches to analysis of scientific data and the evaluation of statistics from different sources have all worked to make the computer's contribution to biomedical research essential over the past 12 years, the spokesman for the center commented.

Seed is Sown

The idea for a health sciences computer center that would involve the research worker directly with the machine without turning the scientist into a computing specialist came to UCLA with Dr. Wilfred J. Dixon, a former professor of mathematics at the University of Oregon, when he joined the university staff in 1955.

Prior to 1960, Dixon said, he and his team of statisticians used the remote access services of Western Data Processing in an effort "to create a resource through which basic mathematics, statistics and computer science could be combined to help biomedical research." In 1962 the Division of Research Resources, through its Biotechnology Resources Branch, funded Dixon's group as pioneers in this field.

Today an IBM 360/91 provides the basis for a computing facility designed to encourage biomathematicians and researchers to work as colleagues, the center's spokesman said. Capable of over one million computations per second, the computer can handle 40 average users at one time and runs 24 hours, seven days a week.

A Memorex 1270 terminal controls all computer teleprocessing. Traditional keypunching and an Imlac graphics terminal make communication with the system easier for the noncomputer trained researcher, he added. While most programs are disk-oriented, the system can and does use tape.

Computers & Medicine

Console Consultation

Beyond the hardware and peripherals available at the computing center, a six-person staff works closely with researchers to assist with specific scientific and computing problems, the spokesman said.

Not only does the staff offer technical advice, but collaborative research in the form of console-assisted joint research and remote tandem console consultation is possible and is encouraged. The spokesman noted the staff has devised a system making it easy for investigators to create, maintain and use large files as well.

Biomedical computer programs designed to meet the statistical needs of noncomputer scientists and a terminal support system called Tortos that enables the researcher to converse with the computer from a terminal located in his office or laboratory complete the major features of UCLA's facility.

"Initially, we made powerful statistical routines available in the form of easy-to-use packages," Dixon commented. "Now we are going one step further, bringing researchers themselves to the computer console. We think they can do a more effective job because the ideas are in their minds as to where their research should go – not in the technician's mind or anyone else's."

Life Sciences Literature On-Line

PHILADELPHIA – The Institute for Scientific Information (ISI) is putting its life sciences literature data base on-line.

Scheduled to be fully opeational by July 1, Scisearch will be a joint effort of ISI and System Development Corp. (SDC).

The SDC retrieval program permits subscribers to conduct rapid literature searches through two-way communications terminals located in their own facilities, with simple, English-language statements.

Covering every editorial item from some 1,100 international life science journals, Scisearch will initially offer a searchable file of over 400,000 items published between April 1972 and the present.

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Minicomputer Counts Cars, Audits Tolls

PLEASANTVILLE, N.Y. – An automated system has been installed to count cars and audit tolls collected on the Saw Mill River and Hutchinson River Parkways in Westchester County, replacing printing machines dating from the 40s.

Although the new equipment wasn't designed to help speed harried commuters through toll booths, information generated on the hourly traffic flow has enabled the East Hudson Parkway Authority to schedule personnel more efficiently, according to Raymond Radzivila, executive director.

Traffic Counts

Traffic counts are fed to a Digital Equipment Corp. (DEC) PDP-8 E at each plaza by treadles and electronically operated loops buried in the roadway at each toll lane. This data is then relayed over leased telephone lines to the authority's DP center more than 15 miles away where it is instantly printed out in machine-readable form on a Teletype ASR-35.

A battery-powered, solid-state backup counter, built from DEC modules, takes over at each toll plaza if any part of the system breaks down.

"The new toll registration equipment has enabled us to reduce our toll collectors by four and our auditing staff of 10 to two," according to Radzivila. These people are now employed in other departments within the authority, Radzivila said.

In addition, auditing a day's toll receipts, which used to take as long as three weeks, according to Radzivila, now can be completed within 24 hours.

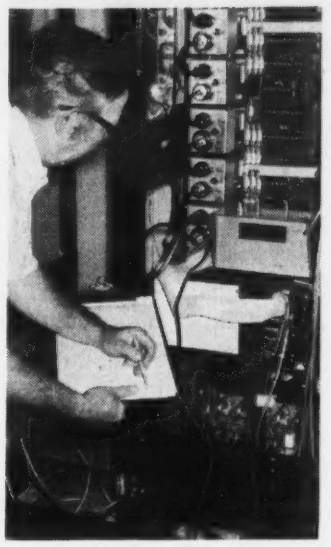
Administration Data

The information gathered by the DEC system forms the basis of the authority audit, scheduling of collectors and statistical reports needed to administer the parkway system.

Tolls collected at these two plazas pay for all highway maintenance on the Cross County, Saw Mill River and Hutchinson River Parkways in Westchester County

The system was designed by Custom Computer Systems, Inc., of Plainview, N.Y. (which is now defunct) under a $129,000 contract.

Traffic at the two toll plazas can vary from 18,000 on a light day to as many as 40,000 recorded on Mother's Day, according to Radzivila.



Computerized toll registration equipment registers vehicle counts.

This Bartender Never Misses a Shot

CLEVELAND – Fast on the heels of women's libbers, the computer has gained admission to bars, all-men or otherwise.

Automated bar dispensing units, such as Addressograph Multigraph's Documentor 2214/15, now do virtually everything except lend a sympathetic ear to the customer.

The basic system consists of a manifold system, "gun" dispensor and a minicomputer.

What's Your Pleasure?

A variety of bottles are placed in the manifold and actuated by a gun held by the bartender. This gun, which looks like a nozzle, has several buttons on the back, one each for scotch, bourbon, rye and so on down the line.

When the weary businessman says, "Give me a scotch, Joe," the bartender pushes the appropriate button, triggering two actions.

Drink and Check

First, the manifold is told what kind of liquor to pour out of the nozzle, and secondly, memory is triggered in the mini through an interfacing system. This tells the system that the order is a scotch, at $1.65, and the Documentor prints out the customer's check.

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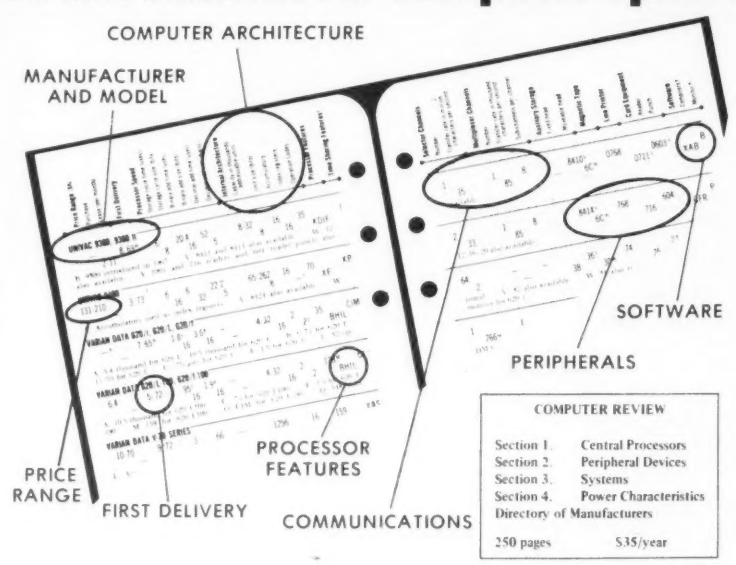

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World Crisis Seen Inevitable Without 'Gigantic' Data Bank

SYDNEY, Australia – Computers, "gigantic" ones, will be the backbone of world government administration to come, Sir Philip Baxter predicted at the Australian Computer Conference here.

Because of the rapid increases in population and consumption of raw materials, the world is inexorably moving toward crisis, if not disaster, Baxter said, according to a report in the *Australian Financial News*.

In order to cope with these increases, a world government is needed, he said, one which would rule "no doubt through some sort of federal system," from 7,000 to 10,000 million people.

To manage the affairs of the world, a system of data collection and analysis will be needed, and together with the computational and analytical facilities necessary to work upon this data, computer systems would be "gigantic," the scientist stated.

The projected government would need data on health, ancestors and genetic makeup, intelligence and educational performance and capacity for employment, Baxter said.

Also, statistics would be needed on "responsibility for worldly possessions," family relationships and political views and aspirations. This information, Baxter said, would be processed and used to frame the world government's policies.

Baxter also suggested the formation of a world data bank comprising the personal, medical and mental histories of thousands of millions of people, according to the *Financial News*.

"Such material, properly analyzed, could provide the basis for a genetic program which could provide supermen," he said.

"If we survive destruction on the way [to the 21st century], the developments out of computer technology will provide a tool, a whole set of tools, with which our descendants will be able to build a better and stable world, in which man can proceed to higher levels in his destiny," Baxter concluded.

Scientists Subject of CAI Test

EINDHOVEN, The Netherlands – While computer-assisted instruction (CAI) has long been used in elementary and secondary schools, it is now being tested as a training technique for scientists.

The aim of post-doctoral training in a laboratory is to develop skills which can be used throughout a wide field and to give the scientists the theoretical basis they need for continual development of these skills.

In other words, the task is far more complex than teaching one specific skill.

A research group conducted a trial CAI course in which the student's activity was mainly directed toward the acquisition of problem-solving skills.

Students Varied

The course, written by Serge Leblanc of the Laboratories d'Electronique et de Physique Applique (LEP), a part of the International Philips Research, was taken by 10 scientists, who varied in age, education and field of interest. The course took from 23 to 38 hours to complete, each scientist working at his own pace as compared with 20 hours of course work plus 20 to 40 hours of individual work in the traditional method.

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Pilferage a Real Nightmare

Fleet Managers Turn to DP to Control Gas Dispensing

PHOENIX – Continuing gasoline shortages and high costs have changed pilferage from a minor irritant to a real nightmare for fleet managers today.

To minimize the amount of fuel lost through pilferage or mismanagement, Engineered Systems, Inc. here has developed an electronic system that controls the dispensing of gasoline or oil – or any other liquid – while at the same time providing a host of other valuable data to fleet managers, according to Jean Birdoes, vice-president sales and finance.

In addition to recording the amount of fuel pumped, the ESI equipment records data such as the number of miles driven, a miles-per-gallon ratio for each vehicle, total oil and gas consumed – giving "a basis upon which a systematic preventative maintenance program can be planned," Birdoes explained.

One system is installed in the City of Minneapolis. Before the driver of a city vehicle can gas up that vehicle, he inserts a wallet-size plastic card into an optical reader wired to the fuel pump in the municipal garage. The card identifies the vehicle by number, the type of fuel used (regular, premium or diesel), the type of motor oil used and whether the fuel dispensed is subject to road user tax.

The driver inputs the vehicle's odometer reading by dialing thumb-switches on the reader box. As the fuel is dispensed, the ESI system automatically records the amount. No fuel will flow unless a valid plastic card is inserted, Birdoes said.

If the identity card is invalid, a red indicator will light on the card reader and no further action can take place.

The reader monitors the fuel as it is pumped, and after pumping is finished, the data is transmitted to a Teletype ASR 33 where it is recorded on paper tape.

Once a month the paper tape is processed in Phoenix by a Data General Nova computer and a summary report is prepared showing management how much fuel was consumed by each vehicle, all vehicles in a given group and finally, overall.

"The report also provides a record of miles driven, a miles-per-gallon ratio for each vehicle, tax monies due and finally, fuel and oil costs chargeable to each user agency," he explained.

A desk console, located in the central office, allows staffers to enter fuel transactions occurring at fueling sites without readers, and the replacement of batteries and tires.

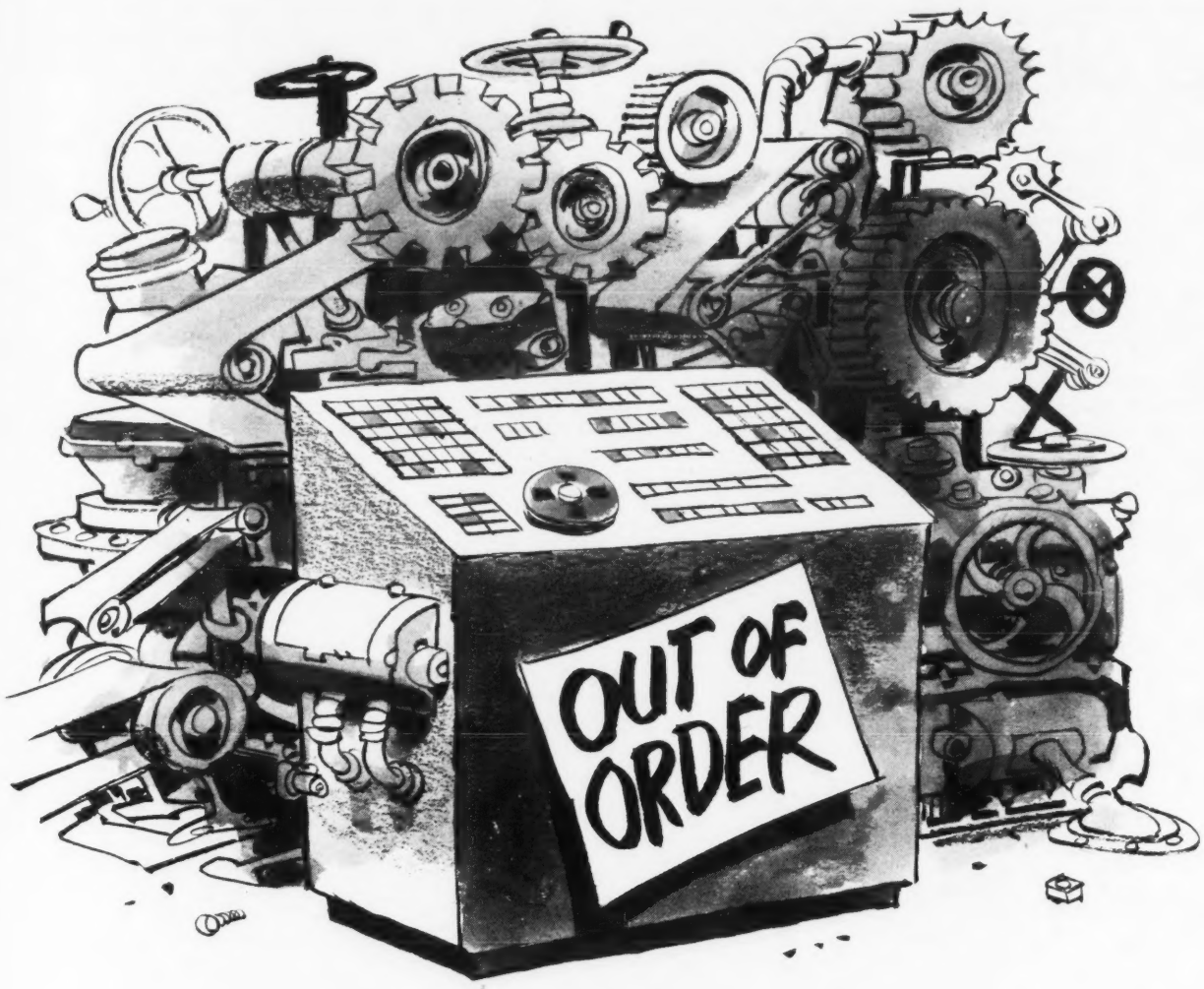
"A system incorporating tires, for example, permits the operator to record a worn tire removed and a new tire installed at the same time," he said.

The Minneapolis system cost the city $28,000.

Other systems designed by ESI include the CM-4000, a data acquisition control system designed to provide precise control of the municipal water system at Lake Havasu City, Ariz. (site of the London Bridge), and a $50,000 computerized unit installed to monitor loading and unloading at the Marathon Oil Co.'s 875,000-barrel tanker terminal in Tampa, Fla.

The Marathon facility receives shipments from about six tankers per month, and handles three grades of gasoline, two of diesel and kerosene for Marathon's direct and private-brand business, as well as shipments for Mobil, Exxon and Tenneco on a throughput basis.

ESI is located at 3017 W. Fairmont, 85017.



Study Shows Research Needed to Determine DP's Societal Impact

MENLO PARK, Calif. – Basic research needs to be undertaken to monitor and understand the social impact of computers, according to a study to be published later this month.

Compiled by the Institute for the Future under an 18-month, $100,000 grant from the National Science Foundation, "Toward Understanding the Social Impact of Computers" proposes and evaluates a variety of research areas, some of which it contends should be pursued.

Workshops

Sixty experts in finance, technology, politics, sociology and economics participated in workshops sponsored by the institute to determine the significant problems and questions raised by the presence of computers in society.

Providing a guide to these priority questions, the study organizes problems under four main headings:

- The use of computer models and simulations as aids to decision-making.
- The use of computers in financial operations.
- Perceptions, attitudes and literacy concerning computers.
- Ways in which access to computers affects individuals, groups and institutions.

Public Understanding

Predicting "the computer industry is likely to be the largest industry in the world by the turn of the century," the study emphasized the need for public understanding of the ways in which "the use of computers can facilitate the acquisition, concentration and manipulation of political and economic power."

The report will be available from The Institute for the Future, 2725 Sand Hill Road, Menlo Park, Calif. 94025, following its publication.

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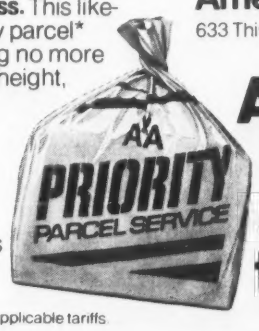

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COMPUTER INDUSTRY

CI Notes

IBM Sees Good 2d Quarter...

ARMONK, N.Y. – IBM Chairman Frank Cary is predicting "a very good" second quarter, as new computer orders and shipments continue to run substantially above year-ago levels.

Cary also cited the continuing high rate of outright purchases of large computers as a positive factor in IBM's financial outlook.

In 1974's first quarter, net income rose 27% to $431.3 million and revenue climbed 22% to $3 billion.

However, "you won't be able to take first-half growth rates and extrapolate the full year," Cary warned, cautioning against using an single indicator in forecasting IBM's future.

. . . While Honeywell Sales Decline

MINNEAPOLIS – Honeywell, Inc. has been experiencing a "modest decline" in the level of computer sales and the conversion of computer leases to sales, an HIS spokesman said.

The firm attributed an increased emphasis on lease rather than sales to "high interest rates as well as general business uncertainties."

The spokesman added orders and shipments of Honeywell's current computer line, the Series 60, "continue to live up to our expectations."

Supershorts

Sanders Data Systems' International Division has appointed Consorico de Importacion y Exportacion, Venezuela, as exclusive distributor in Venezuela and Costa Rica.

– – –

A Computa-Lab automated health testing system was exhibited in Moscow at the international exhibition "Public Health, Medical Equipment & Drugs" – Zdravookhranie – sponsored by the USSR Chamber of Commerce and Industry. The disk-based health data acquisition system was developed by International Health Systems, Inc.

– – –

Lockheed Electronics Co. has appointed ACT Computer Corp. as distributor in Western Canada for the System III minicomputer.

– – –

RDA, Inc. has initiated a third-party maintenance group to provide field service for a wide range of computing and data processing equipment.

– – –

Information Magnetics Corp. has shipped its first Model 5636 IBM 3348-type (Winchester) compatible data module head assemblies.

DP Expenditures to Rise 260%

Bank Market Opening to Data Services

By Toni Wiseman
Of the CW Staff

PALO ALTO, Calif. – During the next five years, revenues earned in the bank data services market will expand by a factor of over 260%, according to a report compiled by Quantum Science Corp.

Commercial bank expenditures for DP in 1972 totaled $1.1 billion, $448 million of which was for data services provided by outside firms. By 1978, annual expenditures will have risen to $2.4 billion, with the data services portion amounting to $1.17 billion, the report said.

One major factor impacting the banking/data services interface is the trend toward industry dominance by larger banks, with the top 25% of banks controlling 80% of the transactions, the report noted.

The report concluded that while large banks can usually handle their own specific software needs, small- and medium-size banks rarely have the resources to develop new competitive banking services which are dependent on major computer software development efforts.

'Under Pressure'

"Software capability is of key importance in penetrating the banking market," Quantum stated. "Such applications as centralized customer information file and single statement processing are beyond most medium and small bank development requirements, yet this group of banks is under a lot of pressure to adopt such systems to compete with larger banks.

"This is the major driver of these banks to data services vendors with proven software," the report stated.

On the other hand, larger banks will represent a significant market for proven software packages, the report said.

Secondary factors pushing smaller banks toward data services cited in the report include the continued difficulty in identifying and reducing operating costs and the limited success of application standardization.

Larger banks often receive both more software installation planning and implementation and more comprehensive operating and application software packages from vendors than do smaller banks, the report stated.

"Although these savings are not sizable, they are significant when a larger bank is evaluating [facilities management] as an alternative to continuing operating its own [DP] installation," the report said.

The Quantum report reached several other conclusions. For instance, large ($500 million to $1 billion in deposits) and very large (more than $1 billion in deposits) banks wanting to discontinue their banking correspondent services offer significant opportunities for increasing revenues to the data services vendors.

Medium ($50 million to $500 million in deposits) and small (less than $50 million in deposits) banks wanting to upgrade or divest themselves of DP customer services also offer significant revenue opportunities to the data services vendors, the report indicated.

Labor, Material Costs Blamed For Industry-Wide Price Hikes

By a CW Staff Writer

There's a bandwagon rolling in the computer industry – an average of 7% to 10% across-the-board price increases. And the reason cited is always the same: "increased costs of labor and materials."

Increases now are coming weekly and it appears that no hardware-oriented company will be able to avoid making some price adjustment by the end of the year.

Last week Control Data joined IBM, Honeywell and Univac, other mainframe companies which have raised prices within the last year. Unlike IBM, however, nearly all companies are jacking prices higher than IBM's Nov. 26 2% across-the-board hike.

CDC, for example, raised prices 2% to 10% depending on product line – and that included IBM-compatible peripherals and OEM products, in addition to its recently announced Cyber 170 mainframe systems. CDC didn't touch software, however.

Breaking ground in a relatively untouched industry segment, Inforex, one of the leading key-to-disk data entry companies, made price adjustments last week to the effect of 6% to 14% with its average increase being approximately 9%.

The approach used at Inforex is unique. It raised its keystation price about 21% without touching anything else. The basic monthly rental price on the company's 2901 keystation will be raised to $53 from $44 effective Oct. 1.

The price of the keystation was raised to $1,350 from $1,200. Maintenance prices remained unchanged.

However, in an attempt to stabilize its long-term lease position, Inforex increased discounts on two-, three- and five-year rental arrangements. From a discount table of 5%-10%-15%, it went to higher discounts of 6%-15%-20% on two-, three- and five-year bases respectively.

This new discount table is offered "to give the user a hedge against inflation," according to the firm.

Memorex Sells Systems Inventory

BOSTON – American Used Computer Corp. (AUC) has purchased Memorex Corp.'s entire computer systems inventory in a joint purchase from Memorex and ILC Leasing Corp.

The original purchase value of the inventory, which consists of 20 central processors, including both Models MRX 40 and MRX 50, was placed at $6.5 million by Adolf F. Monosson, president of AUC. The purchase price was not disclosed.

The purchase inventory also includes Data Products printers, Documation card readers, Wangco and Potter tape drives, plus all the spare parts and subassemblies for the CPUs and peripherals.

Monosson stated the acquisition was consistent with the company's policy of purchasing any type of computer item. In the past, the firm has purchased the computer terminal inventory and lease base of Ex-Cell-O Corp. products and Badger Meter Corp.

In other business, Memorex is reactivating a manufacturing facility and has hired some 75 production employees.

The action, according to J. Garrett Fitzgibbons, vice-president and general manager, media products group, is the result of "substantial orders," including large OEM contract orders for two relatively new media products – Cubic Tape and Cromex Video Tape.

Viatron Near End

BOSTON – Viatron Computer Systems isn't dead yet, but the time seems close.

On June 12, a bankruptcy court here indicated trustee R. Robert Popeo should start work on a plan for orderly liquidation.

The court did not favor a plan by the Debentureholder's Protective Committee that would have paid these creditors with shares of stock in a reorganized Viatron.

However, the debentureholders group will have until July 17 to come up with an alternate plan.

A plan for orderly liquidation would not be "an auction under the hammer," according to Jeffrey Wiesen, counsel to the trustee, but would be followed with the goal of gradually shutting down the company on the theory that orderly sales of the assets would yield more for the estate.

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Conveyors Ready as CDC Waits for Floppy Disk Boom

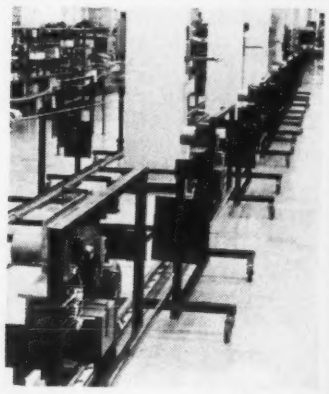
By Molly Upton
Of the CW Staff

HAWTHORNE, Calif. – Control Data Corp. is ready – and waiting – for the boom in demand for floppy disk drives, with a conveyor belt assembly line said to be capable of producing 1,000 CDC 9400s a month.

But Tom C. Farrell Jr., Hawthorne marketing manager, expects volume orders won't come in until the end of the year, since OEM customers are currently in the process of designing their systems around the drives.

While waiting for the floppy market to develop, CDC is busy with its reengineered 9427H double-density, 200 track/in. cartridge drive designed for minis, which is "competitively priced."

Prices on the new 9427H, known as the Hawk for Haw-



CDC's 9427H cartridge disks are produced on a motorized assembly line.

thorne, start at $6,075 for one and drop to $3,830 for 100 units, Farrell said. These are higher than the 9427 prices in the low-volume end, and lower in the large-volume end, he said.

Currently the plant here, which was transferred to CDC as part of the Control Data-NCR agreement giving birth to Computer Peripherals, Inc. (CPI) turns out about 200 floppy drives per month, he said.

60,000 in 1974

Farrell estimated the floppy drive market was around 12,000 units in 1973, and projected it will be about 60,000 in 1974 and 120,000 units in 1975. He said he suspects IBM is shipping 1,000/mo.

But until the volume orders come in, there will be some hard times for some of the floppy disk makers, he said.

By the end of this year, there could be as few as three or four floppy drive makers, down from about 14 who are either now in the business or just entering it.

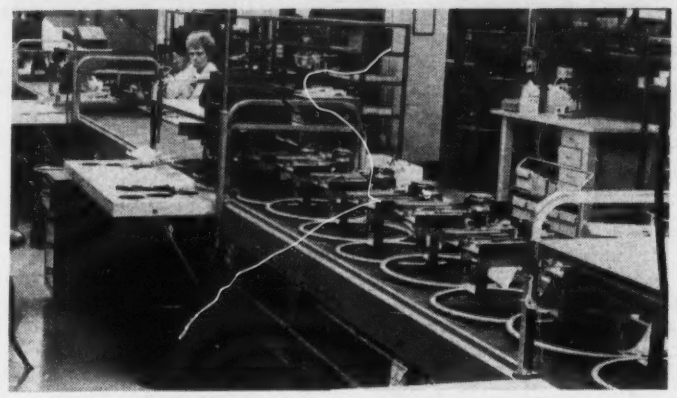
On pricing, Farrell said, "We intend to be competitive without being a leader in price erosion." CDC sells its 9400 drive for $625 in single quantities and $500 for quantities of 500.

With more media manufacturers producing floppies, the price should soon drop drastically from $6-$8/disk to $2-$3/disk, Farrell observed.

With IBM's new ceramic head, which has been installed at some sites, eight-hour operation of floppy drives should be possible, Farrell said. "The thing doesn't look like it will wear out."

A considerable portion – 75% – of CDC's investment in gearing up for volume production of floppy drives is in industrial engineering, Farrell noted. And it will take volume production to recover this investment. For instance, instead of sand blasting, CDC will use a permanent mold die casting to form the frames.

The production line conveyor belt, set up to produce a drive every nine or 9.5 minutes, is the product of former NCR personnel now working for CDC, he added.



CDC's 9400 floppy disks are assembled on a conveyor belt.

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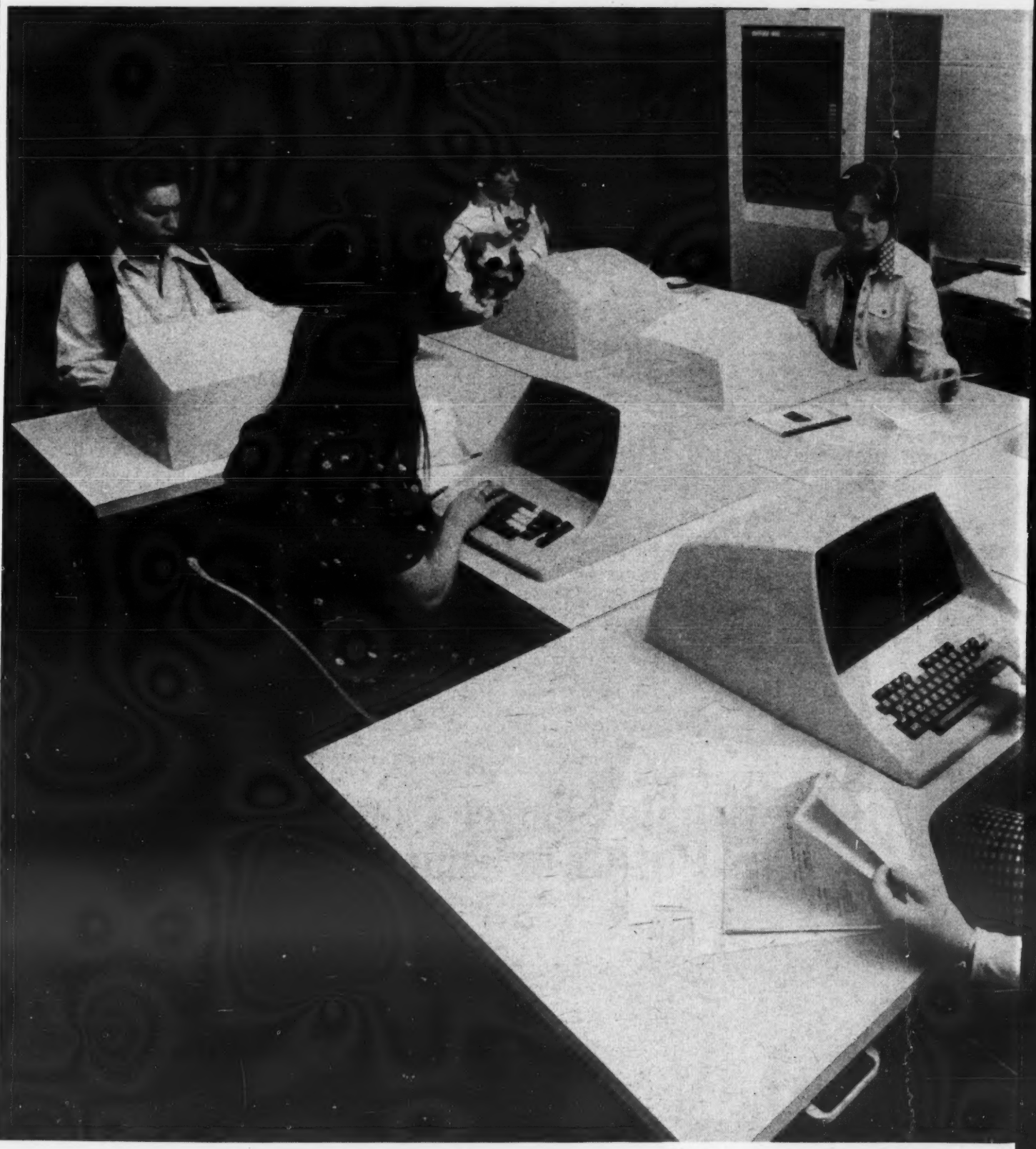

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Fledgling Firm Finds

Floppy Sales Beat Projections

By Molly Upton
Of the CW Staff

SUNNYVALE, Calif. – The worldwide market for floppy disk drives will be around one million units over the next five years, or between $300 million and $500 million, according to estimates by Otis S. Page, vice-president, marketing for Shugart Associates.

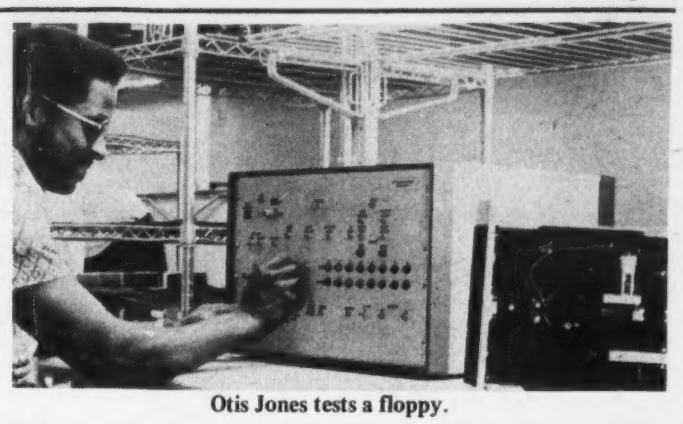
Much of this market will be occupied by mainframers who will supply their own drives, but fully half should belong to the OEMs, he said. "The question is, how big will IBM be in this market?"

Floppy drives are selling a bit faster than Shugart, a year-old company, had projected, he said. The firm estimated it would have an inventory of around 200 drives at the end of December and 500 by April.

However, since Oct. 1 Shugart has shipped 1,500 drives, and is attempting to build an inventory to relieve some of the pressure on production, he said.

Page said he originally thought there would be many firms designing products for IBM 3740 types of systems, but most of Shugart's customers are involved in markets in other areas, such as industrial applications. "The majority of customers are interested in media interchangeability and functions," he added, noting floppies are finding their way into a variety of uses.

The IBM 3740 is "competitively priced" and Page said he thinks people are waiting for IBM to open up the flexible media data entry arena.



Otis Jones tests a floppy.

The timing of IBM's announcement of its 3740 proved to be fortuitous for the fledgling firm. The day Page and others left Memorex to form Shugart Associates, IBM entered the floppy market, and the founders were able to procure financing rapidly, he said.

The plan was to grab a position in the market quickly, as the product had no competitive protection, he said.

In addition to its random access capabilities, the floppy drive is far more reliable than a cassette drive, he noted. In any low

Otis S. Page

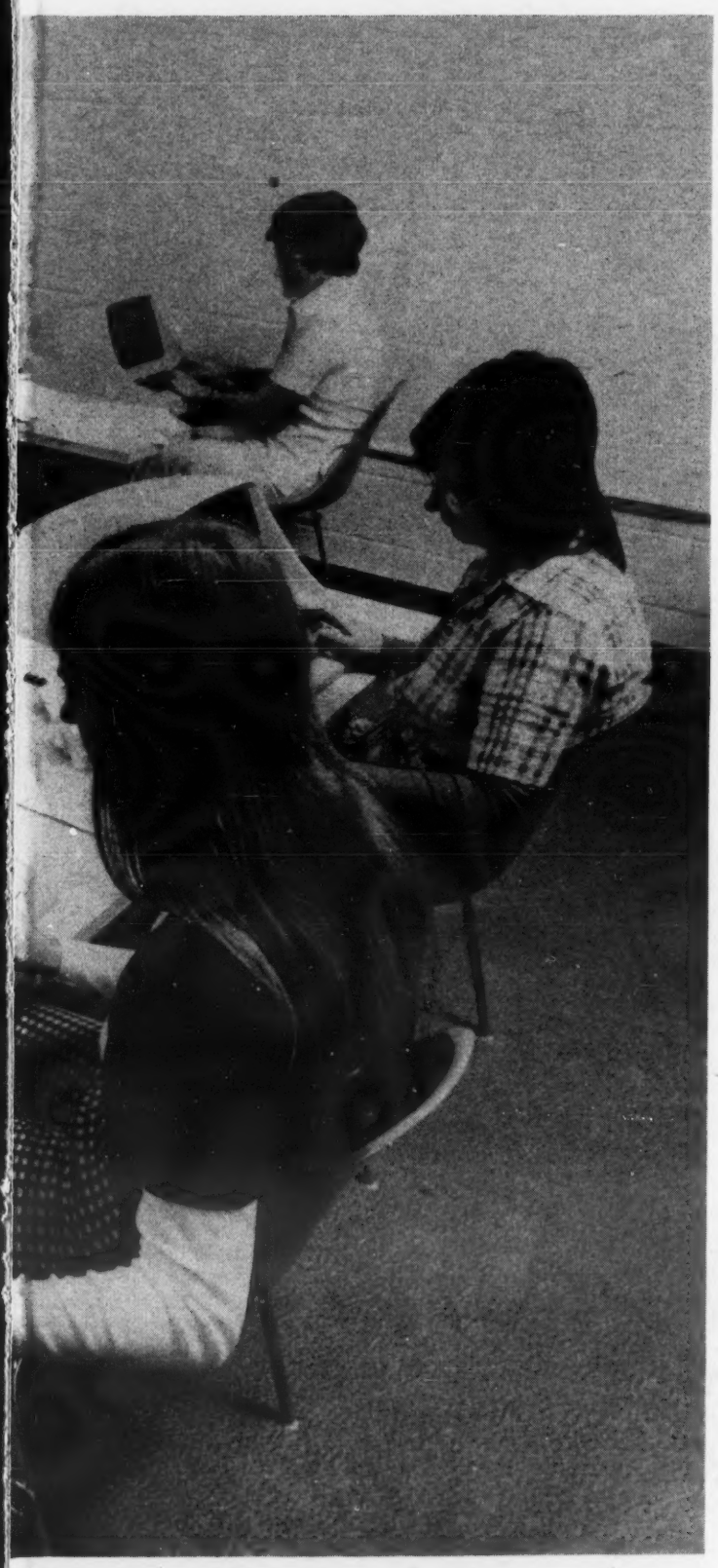
cost system, a significant part of the profit and loss statement is determined by service, he noted.

The floppy drive market could be much larger if other products, not normally considered in the traditional DP market, are included, Page added. Calculators and small accounting machines, especially in Europe, are adding floppies to their systems.

Shugart plans to introduce a low cost, medium speed 100- to 300 line/min printer in the fourth quarter, he mentioned.

This product will alleviate customers being printer bound, and, with the floppy drives as well as entry capability, turn a small accounting machine into a data processing unit.

Shugart's dual diskette drive shares only the drive motor and printed circuit board and contains two actuators. By optimizing on the design of the single disk drive, he explained, the firm retains a high degree of commonality of parts between the single and dual units.



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Despite Fluctuating Economy

Japanese Expecting 30% Growth in '74 DP Market

Special From Shukan Computer

TOKYO – Due to a fluctuating economy here, the outlook for Japanese DP investment is gloomy for 1974. Nevertheless, principal mainframe manufacturers are anticipating a growth of up to 30%, with plans to expand their customer base and end-user markets.

The first half of 1973 was satisfactory, but during the last half – particularly since the oil crisis – a slump was expected due to cancellations and postponed deliveries. However, an overall growth of 10% to 20% seems to be indicated.

Along with deliveries of new models and interim machines, equipment replacements seem to have advanced considerably. Reflecting these circumstances and changes in the financial situation, Japan Electronic Computers' (JECC) DP purchasing record for 1973 is assured, for the first time, of reaching the $350 million mark (compared with $280 million the previous year).

This seems to be due, not so much to increases in the number of computers, but to active interest in upgrading and converting to higher level machines.

Fujitsu's business record for the last half seems to have attained the $385 million mark, with profits after taxes at $16.4 million to $16.8 million. Considering the ratio for DP equipment (56.1% for the first half), proceeds for 1973 in this area are assured of reaching the $350 million mark.

Hitachi in this area also reached the $280 million mark through the first and second halves, and Japan Univac the $210 million mark ($180 million the previous year), indicating a growth of about 20%.

Large, Stable Users

The forecast for 1974 is in a state of flux due to present economic conditions, but a 30% growth is presumed. This can be interpreted as a strategic stance taken toward expansion among large users who have entered a relatively stable stage, as well as new, medium to small users.

The potential market for equipment renting for under $3,500/mo is said to be close to 10,000 in the Tokyo area alone, and marketing activity among businesses which have not yet installed computers is likely to be stepped up.

International News

This trend is evident in the sudden growth in the users of billing machines and small computers such as the Tosbac 1150, Hitac 8150, NCR 399 and Facom 230-10.

In order to open up a new market among end users, IBM is actively promoting System/3 machines. Moreover, it is believed that systems of a level lower than the System/3 will appear around 1975-76, giving added significance to the expansion of the end-user market.

Orders received during the fourth quarter of 1973 vary according to companies.

Fujitsu with its new Series 8 is in a favorable position. Hitachi takes a cautious approach, but with the prices of small and super-small computers rising, there was a rush to install computers within the year. At Burroughs, orders received in January came to $21 million, the highest level in the history of the company.

DP investments by businesses are expected to come from new users, as well as from experienced users, with increased utilization of data bases and upgrading and increasing installations of mainframes accompanying on-line development. Furthermore, the demand for terminals and minicomputers is expected to continue growing.

Japan Contemplating Data Protection Law

Special From Shukan Computer

TOKYO – The Ministry of Postal Services here is in the process of formulating proposals for the development of laws relating to data processing, or data laws.

Currently, Japan covers the area of information processing with existing penal and civil codes and copyright laws, laws whose application must, in many cases, be confined to the spirit of the law.

This is particularly true with respect to damage compensation arising from theft of information from computers or losses due to error, where there are no precedents and existing laws are inadequate.

Identification System

Japan does not have a citizens' numerical identification system, but industry's use of a similar system is spreading and is, in some cases, being used for personnel administration and evaluation.

For industry there is a self protection system but for individuals there is absolutely no protection of privacy. The problem is one of how to manage the protection of individual privacy vis-a-vis society and vis-a-vis governmental authority.

During 1974, the ministry will issue some formal plans based on its study of the issue, contained in its report "Various Problems Associated with Information Technology," and, by 1975, come to grips with data laws in a concrete way.

Paper Prices Rise; Reasons Unclear

Special From Shukan Computer

TOKYO – The price of computer paper here has gone up as much as five times since last year, with no clear explanation for the cost increase from manufacturers.

Some members of the paper industry claim choice quality paper such as computer paper, for which there is little demand, is not profitable.

Other manufacturers maintain the price has simply been too low until now, and computer paper is currently cheaper than stationery.

Other claims are that incorrect prices were quoted in the newspaper and that the circulation route of paper is extremely complicated, therefore it is impossible to determine exactly where the prices are being raised.

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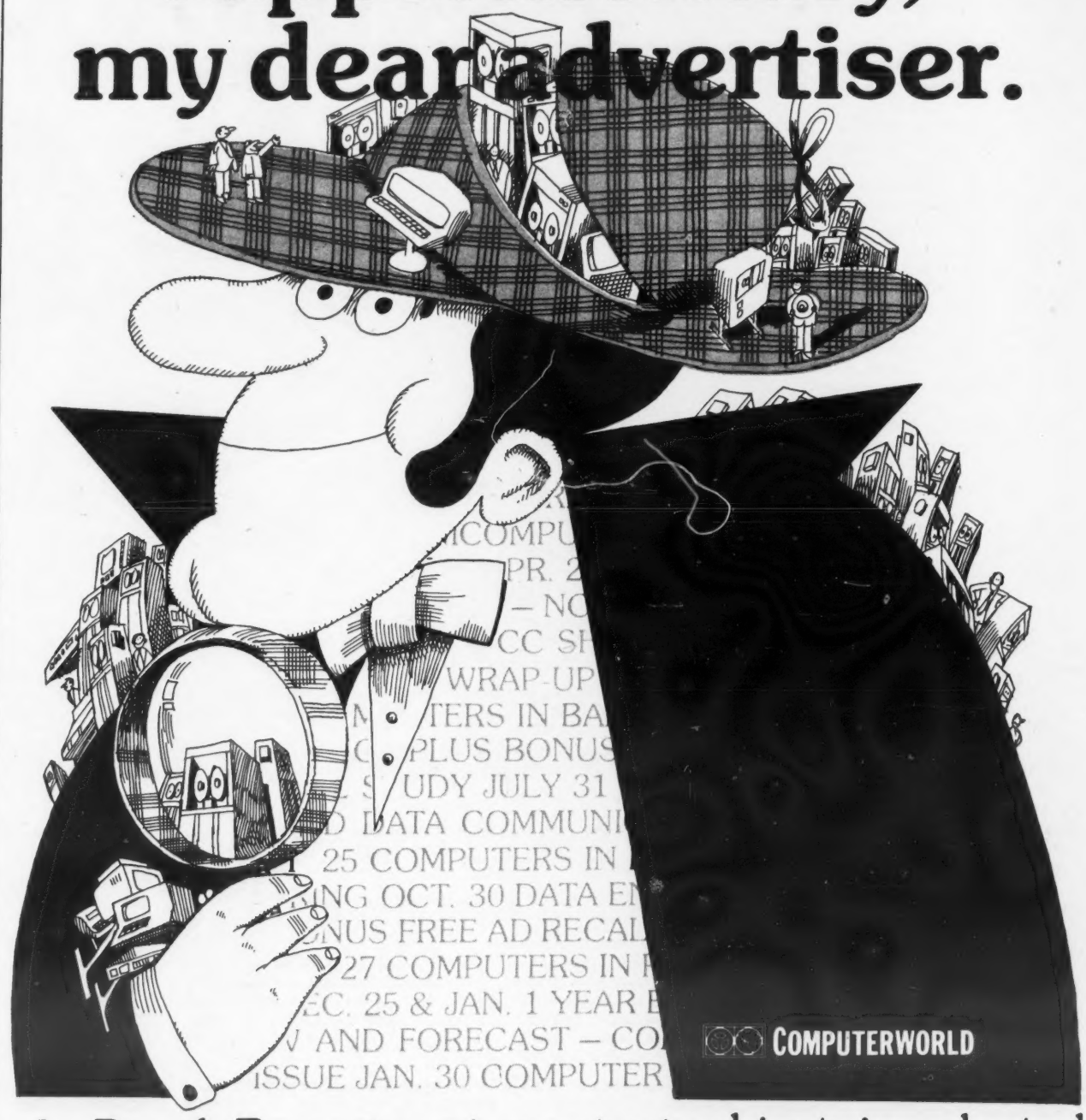

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SOS Lets GA Bring Product Line 'Down'

By Molly Upton
Of the CW Staff

ANAHEIM, Calif. – Use of the silicon-on-sapphire (SOS) chip is enabling General Automation (GA) to broaden its product line downward into the bare-bones micro- and minprocessor area as well as to let customers know GA has the technology, according to Mike Ford, vice-president of the Standard Products and Systems Division.

With SOS, GA offers a microprogrammed 16-bit processor on one chip with a control read-only memory chip, or a two-chip processor compared with other products incorporating seven or eight chips.

In addition to the cost savings through the processor design, the hybrid memory of 1K LSI/MOS memory chips mounted on ceramic substrates packaged on a 7-3/4 in. by 11 in. board allow "semis to compete with core," Ford noted.

The design of GA's LSI 12/16 and LSI-16 will permit the substitution of 4K chips for the current 1K chips, allowing up to 128K on one memory board, he said.

Although GA has no immediate plans for such a product, upgrade capability is an asset when selling the machines on the OEM market, Ford admitted.

With its LSI 12/16 and LSI-16, GA plans to penetrate some specific customer and applications markets, such as terminals, office equipment, small machine control applications and generally large-volume orders, usually with some communications capabilities.

New Technology

One reason for coming out with what is new technology for commercial DP in the OEM area is to let customers become accustomed to the idea of SOS chips, he said. OEMs ordinarily take about six months to a year to design their products around a new processor, and by the time these systems reach the market in volume, the concept will not seem so radical to the end user, he said.

"We're trying to pull into the commercial minicomputer world technology inherent in West Coast aerospace," Ford said. He admitted that if GA "had cooked up SOS by ourselves, there might be a credibility gap." But since SOS has proven its reliability in the military, this shouldn't be a problem, he added.

GA designed the mask, and Rockwell is setting up production facilities for the SOS chip.

Also, by incorporating the SOS technology now, GA has demonstrated to its OEM customers that its product is not about to be outdated within the next few years.

The SOS fast cycle time, about 1.8 μsec, enables GA to offer a price performance ratio that is competitive with MSI micros, MOS/LSI micros and minis, Ford said.

Volume deliveries of the 12/16 are scheduled to start this fall, and the LSI/16 after the first of the year, Ford said.

Litton Charges Datametrics With Breach of Contract

LOS ANGELES – Litton Systems, Inc. has charged Datametrics Corp. with breach of contract in a suit filed here.

Under a five-year sales agreement that ends Oct. 1, Datametrics supplies standard model printers to be marketed solely by Litton through its Datalog Division. Datametrics makes and markets special printers directly.

Datametrics has informed Litton that it does not plan to renew the agreement because it has determined that renewal is not in its best interests, the firm said.

The Litton complaint seeks damages in an unspecified amount, a declaration as to the rights and duties of the parties under this sales agreement, and a permanent injunction prohibiting Datametrics from manufacturing, marketing or selling printers for 18 months.

Datametrics said it intends to defend itself vigorously.

Executive Corner

- Walter A. Foley has been named a member of the board of directors and vice-president, digital systems and equipment, for Megatek Corp.
- John Booth has been appointed to the board of directors of Tycom Corp., Fairfield, N.J.
- James F. Betts has been elected a director of Systems Engineering Corp., an affiliate of Richmond Corp.
- John Elson Kirkpatrick has been named a director of Academy Computing Corp.
- George W. Armerding has been appointed president and chief executive officer of Capital Data Systems, Inc.
- James W. McKee has been elected president of True Data Corp.
- Adrian G. Sanford has joined Louis Zahn Data Service Corp. as executive vice-president.
- William H. Renfrew, Jr. and M. Arthur Gillis have been named senior vice-presidents of Information Sciences, Inc.
- Raymond E. Valle has been promoted to vice-president of Data Technology Corp.
- William L. Poland has been elected vice-president of technology of Computer Peripherals, Inc., the jointly owned company of Control Data and NCR.
- Derwin C. DeForest and Dominic J. DiFalco have been named vice-presidents of Grumman Data Systems Corp.
- James W. Proctor has joined American Management Systems as vice-president, customer automated services.
- William Kurt Anderson has been named vice-president of marketing for Data Processing, Inc.
- Proprietary Computer Systems, Inc. has appointed two new vice-presidents: Warren Juran, to head marketing and support; and James Koch, in charge of accounting and inventory systems.
- William R. Rummler has been elected vice-president to head computer leasing services for Evergreen Computer and Financial, Inc.
- J.G. Simmons has joined Wiltek, Inc. as vice-president of marketing.
- Edwin M. Presnal has been named vice-president, On-Line Division, Anacomp, Inc.
- Amdahl Corp. in Sunnyvale, Calif., has announced two appointments: Robert W. Armstrong to vice-president of marketing and operations, and William N. Mozena to vice-president of finance and administration.
- Angelo DiGiugno has been appointed vice-president, manufacturing and Anthony C. Nicoletti has been named vice-president, customer services for Bunker Ramo Corp.'s Information Systems Division.
- Paul G. Prager has been elected vice-president of finance and administration for Tesdata Systems Corp.

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Systems programming position for an individual with education and experience in the use, maintenance, and internal working of: APL, OS-HASP (OS-MFT II), Assembler, Telecommunications Support, System Generation, 370/155, 3330's, 3705 "front-end", terminals, etc. Future plans include VM/VS and shared variable (APL-SV). Closing date — July 8, 1974.

Coast Community College District
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PROJECT MANAGERS PROGRAMMER/ANALYSTS

A consulting and computer services company specializing in the design and implementation of Material Requirements Planning systems is seeking individuals with programming and systems background in manufacturing applications. An understanding of B/M Processor and M.R.P. is required. Production and Inventory Control user experience will be a plus. A challenging opportunity with a professional team. Excellent salary/company benefits. Please send resume, including references, to:

RICHARD C. LING
VICE PRESIDENT
ARISTA INFORMATION SYSTEMS, INC.
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POSITION ANNOUNCEMENTS

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New England's largest employer has two attractive career positions for versatile individuals interested in challenge and growth potential. The high technology environment, varied nature of the problems and excellent salary levels will appeal to ambitious persons thoroughly experienced in computer sciences.

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This position requires computer resource planning, including evaluation and selection for mainframes, peripherals, and teleprocessing equipment. The individual selected will translate workload forecasts into computer capacity requirements.

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This is an important key position requiring at least two years IMS/V2 and ALC experience. We need your help to convert IMS/VS from 370/165 to 370/168.

Pratt & Whitney Aircraft
Division of United Aircraft Corp.

Please send your resume (including salary requirements) to Mr. H. M. Heldmann, Professional Placement, Office 124, Pratt & Whitney Aircraft, East Hartford, Connecticut 06108.

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PROGRAMMERS PROGRAMMER ANALYSTS

About the company:
Foremost is the leading national mobile home and recreational vehicle insurer. Our rapid growth is evident:

Employees		Premiums written (in millions)	
12/71	792	1971	128.9
12/72	1149	1972	187.0
11/73	1648	1973	224.0

About our EDP group:
IBM 370/158, VS2, ANS COBOL, multi-programming, Mohawk off-line batch processing, in-house education department project team approach.

About the job:
PROGRAMMERS:
1-3 years business applications experience on IBM 360 or 370, DOS or OS, ANS COBOL or COBOL. Insurance applications experience helpful.

PROGRAMMER/ANALYSTS:
3-5 years experience in systems analysis and programming on IBM 360 or 370, DOS or OS, ANS COBOL or COBOL. Require applications experience in (1) financial systems, (2) direct billing systems, or (3) insurance claims, premium entry, or reporting and evaluation systems.

Send resume with salary requirements to: Colleen Brown

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Electronic Systems Personnel
1705 Fisher Building
Detroit, Michigan 48202

HARTFORD
Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105

KANSAS CITY
Electronic Systems Personnel
370 TenMain Center
Kansas City, Missouri 64105

LOS ANGELES
Career Data Personnel Agency
Suite 323
3303 Wilshire Boulevard
Los Angeles, California 90010

MILWAUKEE
EDP Consultants
11430 W. Bluemound Road
Wauwatosa, Wisconsin 53226

MINNEAPOLIS/ST. PAUL
Electronic Systems Personnel
801 Nicollet Mall, Suite 1716
Minneapolis, Minnesota 55402

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Electronic Systems Personnel
106 Lawyers Building
428 Forbes Avenue
Pittsburgh, Penna. 15219

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SYSTEMS PROGRAMMER

Systems Programmer, prefer 3-5 years experience in Communications and/or PDP-11 Software. Permanent position with interesting, rapidly expanding firm in Eugene, Oregon. Please send resume to:

Personnel Coordinator
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COMPUTER CENTER & COMPUTER SCIENCE

The State University College of Arts and Science at Geneseo has four vacancies on the staff of the Computer Center.

DIRECTOR:
The Director, reporting to the Vice President for Academic Affairs, is responsible for all resources, personnel and activities of the Computer Center. A staff of 5 professionals service all administrative and academic support systems. Equipment includes a B3500, and telecommunication links with an IBM 370 (interactive) and a CDC 6400 (batch). Applicants must possess at least five years of experience in progressive levels of responsibility in an academic computing environment, and employment experience with major computer manufacturers. Salary to $18,000 for a 12-month appointment depending upon professional qualifications and experience.

MANAGER OF ACADEMIC SYSTEMS/PROGRAMMING:
This individual will be responsible for developing and maintaining computing services to support the research and instructional functions of all academic departments in the college. Applicants should have a Ph.D. in Computer Science or some closely related discipline. Undergraduate teaching experience, a demonstrated research record, and utilization of varied software packages on different hardware configurations are mandatory. Salary to $16,000 for a 12-month appointment depending upon qualifications and experience.

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Two full-time faculty at the Instructor/Assistant Professor level are needed for undergraduate Computer Science instruction. Courses emphasize programming and software applications. Applicants must possess a Master's degree; experience in hardware/software applications and/or collegiate-level teaching is desirable. Salary $11,000-$12,500 for 10-month appointment depending upon professional qualifications and experience.

Apply by transmitting a *vita*, three letters of recommendation and official transcripts of collegiate-level work to James Billet, Assistant Vice President for Academic Affairs, State University College of Arts and Science, Geneseo, New York, 14454. Applications must be postmarked no later than 15 July 1974.

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The First National Bank of Chicago is looking around for Data Processing talent that's ready for significant career action... Now.

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Dear Personnel Director:

I hear you're looking for SYSTEMS ANALYSTS, PROGRAMMER ANALYSTS and PROGRAMMERS who want the challenge of involvement in far-reaching financial applications . . . in an aggressive team environment where individuality is encouraged and recognized. This is the professional atmosphere I'm looking for. My experience has been impressive. My technical ability is coupled with creativity. My background in PL/1 and assembler languages is compatible with your 370/168 OS environment. I'm also familiar with teleprocessing. You have a reputation as an aggressive EDP innovator in the banking industry. I'd like to be part of it.

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Name .....
Address .....
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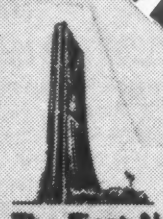

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NEEDS

COMPUTER PROGRAMMERS

A+ RATED FIRE AND CASUALTY INSURANCE COMPANY HAS IMMEDIATE OPENINGS FOR EXPERIENCED PROGRAMMERS

MINIMUM REQUIREMENTS

Experience on 3rd Generation Hardware preferred. Desirable experience includes knowledge in any of the following: ANS COBOL, PL/1, SYS/360 Assembly Language, OS, TP, IMS, Data Base Design, TSO.

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  (Current System Includes Dual 370/158's Megabyte each. 2 Billion Bytes DA Storage, 100+ on-line CRT Terminals)
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Send resume with detailed elaboration of experience and salary expectation to:

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Pansophic Systems is five years old; our products are marketed worldwide . . . gross sales have doubled every year. Spectacular growth has created the need for additional sales representatives in all major U.S. markets and Canada. There are positions for bilingual reps in our international sales force.

Send a current resume to Tom Schmitz, VP Domestic Sales or Dean Mohlstrom, VP International Sales or call (312) 325-9600.

Pansophic Systems, Incorporated
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Our Management Information Systems activities are expanding at a rapid rate . . . and we're on a talent search! Interesting assignments with a strong, viable company working within its Management Information Systems Department. EDP with two 370/158 computers under OS/MVT environment. Operations include data collection and real-time systems using IMS-V2 to access information data bases.

Our Connecticut location offers an abundance of recreational facilities, great housing and excellent schools. Immediate openings for:

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TO INTERVIEW, please forward your resume, stating present salary, to Mr. M.I. Bilanchone, Professional Placement, Hamilton Standard, Windsor Locks, CT 06096

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Computer Peripheral Sales

You can enjoy the benefits of an exciting and rewarding career selling CalComp mass memory disk and tape systems and digital plotting equipment. A complete line of hardware with extensive software support is available for more than a hundred different computer systems in a wide variety of specialized applications. CalComp is a world leader in the design and manufacture of computer peripheral equipment. Our sales growth from $11 million in 1967 to over $100 million in fiscal 1974 is most conducive to your career success. To continue this growth pattern, we are expanding our local field offices.

Current openings exist in 15 key cities throughout the U.S.

To qualify for these positions, you must have a record of successful sales performance in an IBM or UNIVAC competitive marketplace. We would prefer familiarity with IBM or UNIVAC computer users and installations in your territory.

In addition to the opportunity for career growth, we offer excellent fringe benefits and compensation in the form of base salary plus commissions.

Please send resume and earnings history to personnel office nearest you.

650 E. Swedesford Rd.
Wayne, Pa. 19087

2411 W. La Palma Ave.
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CALIFORNIA COMPUTER PRODUCTS, INC.
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ANALYSTS/PROGRAMMERS

Are you interested in working for a leading financial institution in the Mid-South? If you are an experienced IBM/370 OS Systems Analyst/Programmer and desire a challenging career in a banking environment, contact:

Robert E. Weir
Vice President—Data Processing
Union Planters National Bank
P.O. Box 387
Memphis, Tenn. 38147
(901) 523-6757

Banking experience is desirable, but not a prerequisite.

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Help Wanted

Interesting marketing opportunity with PDP-11 Systems & Communications Software Group. Looking for a unique, hardworking, technically competent, innovative marketeer.

TECHNICIANS looking for marketing opportunity encourage to apply. Attractive salary and commission plan. Qualifications include: A genuine interest in an excellent marketing opportunity and a desire to be on the entrepreneurial edge. Women and minorities are encouraged to apply. Firm based in Eugene, Oregon. Location could be on East Coast or in Eugene. All interested, please send resume' and letter to:

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Eugene Oregon, 97403

IMMEDIATE OPENINGS IN

COMPUTER SYSTEMS

NCR

DATA PROCESSING DIVISION SAN DIEGO

The combination of NCR and San Diego means a career without compromise. Here you can create your own life style. You can camp, fish, swim, boat, picnic and hike practically in your own back yard and play golf year round on any of 65 local courses. The career part is even better. At NCR Data Processing, you have a chance to earn an important place as fast as your abilities will permit.

DIAGNOSTIC PROGRAMMERS

Work involves creative use of existing computer logic to isolate faults to board or component levels in automatic diagnosis of malfunctions in central processing units, peripheral units and on-line systems. Specific activites include writing test outlines, coding, debugging and documenting programs. Position requries a degree in computer science or electronic engineering plus 2 to 5 years' applicable experience and familiarity with both hardware and software.

SOFTWARE DEVELOPMENT PROGRAMMERS

- Data Management Software
- Executive Software
- Compiler Design

Positions available in analysis, design and implementation of data management, executive software and compiler design. Experience in one or more of the following areas is required:

- Data base/file management
- Telecommunications, multi-programming on-line systems
- Executive software file access method
- Sort and recovery systems
- Design on peripheral I/O software
- RPG II Programming on Systems 3

ENGINEERING PROGRAMMERS

Positions will involve logic test generation for large circuit cards using automatic tests generation software. Task will also involve the review and modification of new logic designs for testability purposes. Candidates must have logic design experience and working knowledge of at least one programming language. BS in EE or computer science preferred. Positions available at all experience levels.

FIRMWARE PROGRAMMERS

Design and implement virtual storage emulator, iniatizer and linkage loader programs. Maintain existing assemblers and compilers. Requires BS degree in the sciences plus 2 years' experience in assembler language.

SYSTEMS ANALYST

Evaluate total systems and software for DPD's advanced computer products. Experience in one or more of the following areas is required.

1. Develop requirements for new systems.
2. Develop performance performance data using hardware and software measurements techniques.
3. Competitive analyses. Particular emphasis is to be in the software analysis area.
4. Digital Simulation Techniques.

Degree in Math or the Sciences. At least 2 – 3 years' experience in software development for medium to large scale computers. Experience in software measurement and evaluation.

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Openings exist in several areas of systems specification and analysis department. These positions require people with broad technical understanding of computer systems and an understanding of the business aspects of an EDP space R&D organization. Positions include:

- **EDP TECHNOLOGY ANALYST**

Requries a knowledge of industry trends in peripheral product development with the ability to translate the trends into product requirements.

- **PRODUCT DEVELOPMENT ANALYST**

Involves the preparation and coordination of new product proposals. Will do financial and competitive analysis of new product proposals with presentations to management.

- **EDP TECHNICAL/BUSINESS COORDINATOR**

Will coordinate all aspects of R&D programs related to product life cycle planning and associated budgeting and scheduling of products.

These positions require either a Bachelor's degree in Engineering or Business with a MBA desirable. Positions require good communications skills and the ability to interact with all levels of management. Positions are available at various levels in the organization.

Employees will enjoy excellent salary and top working conditions with a non-defense employer. Fully paid life, hospital and medical plan for employees and dependents. Full travel and relocation allowance.

To apply, send resume including salary history to the Professional Placement Office at the address below.

NCR

DATA PROCESSING DIVISION
16575 W. Bernardo Drive, San Diego, Calif. 92127
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SYSTEMS PROGRAMMERS

We are seeking several professionals who are experienced in systems programming to support large-scale IBM computing systems and advanced DB/DC systems development.

- IBM 370/165; 370/168; 370/135's; 360/65
- RIE terminals; 3270 CRTs; COMTEN 3760; shared DASD
- OS/MVT; HASP (shared spool); IMS; CICS; VSI

Requires aggressive professionals with experience in one or more of the following areas:

- Operating systems installation and support DS/MVT/HASP; VA
- DB/DC systems installation and support IMS; CICS
- Programming and operations technical support ALC; PL-1; JCL; data management
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A large financial services organization has an opening for an Analyst/Programmer. This position requires at least 2 years experience in CFO, CFOII or 4 to 6 years life insurance data processing experience. Knowledge of ANS COBOL, BAL, and CICS is preferable.

Salary commensurate with experience plus excellent company benefits. Send resumes to:

Mr. Kermit Essex
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Integon Corporation
420 North Spruce St.
Winston-Salem, N.C. 27102

EXECUTIVE DIRECTOR OF THE COMPUTER NETWORK

University of Nebraska System

The University of Nebraska seeks to fill a major administrative position at the University-wide System level. The Executive Director of the Computer Network is responsible for the entire range of computer activites in the University of Nebraska. Instructional, research and administrative computing services are provided by the Computer Network. The Executive Director should have experience in managing a large computer service organization, preferably in a major university. Familiarity with modern computing equipment and networking is essential. For further information, including a position description, contact **William C. Erskine, Executive Vice President for Administration, University of Nebraska, 3835 Holdrege, Lincoln, Nebraska 68503.** *Inquiries will be responded to until July 15, 1974. The University of Nebraska is an Equal Opportunity/Affirmative Action Employer.*

DATA PROCESSING PROFESSIONALS

Proj. Ldr. - Fin. D.B. Sys.	$16-20K
Sys. Prog.-DOS/CICS	$11-15K
Appl. Prog.-PL1	$11-18K
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Prog./Anal.-Cobol/Mfg.	$12-19K
Prog./Anal.-PL1/Distrib.	$11-14K
Prog./Sys.Des. Interp.	$18K
Sys. Anal.-Fin. D.B. Sys.	$12-18K
Sys. Anal.-Ins.	$15-17.5K
Sys.Anal.-Mfg.	$12-17K
Operations Supv.	$11K
Mktg. Appl. Engr.	$18K+
Sales Support Rep.-OCR	$14-18K
Sales (sev.) HDWE-SFTWE-SVCS	$18K+
Field Serv. Engr.	$11-18K

As specialists in the search for professional and management talent in the data processing field, we seek talented individuals for these and many other current openings. If you are now a manager or ready to become one, please send your resume in complete confidence or phone Frank Keeley, Boston or Mary MacAdam in Braintree. Employers pay our fees.

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College of Lake County, a 5 year old comprehensive community college of over 5,500 students in northern Illinois, seeks a Data Center Director. Center includes staff of 7, Burroughs B-2700 computer system, used largely for administrative use.

Director must have computer science degree as its equivalent and some related experience. Knowledge of COBOL, management information systems, systems analysis, and data center administration is highly desirable.

Salary commensurate with qualifications. Contact:

Dr. W. Harold Garner
Dean for Administrative Services
College of Lake County
19351 West Washington Street
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Phone: (312) 223-6601

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CalComp is the leading independent manufacturer of disk memory equipment and the world leader in computer graphics. Our continuing growth rate has created an immediate need at our Corporate Headquarters in Anaheim, California, for a Training Instructor to teach theory and operation of digital computer and peripheral equipment, including training programs, for field service personnel.

Position requires at least 2 years experience teaching the maintenance of computer peripheral equipment. Experience on tape and disk equipment preferred.

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CALCOMP

California Computer Products, Inc.

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We are specifically looking for experience in:
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*Software Development
*Real-Time Programming
*CS-1, CMS-2 Programming
*Multi-Processing System

Experience in the following computers is desirable:
*UNIVAC CP-642 A/B, 1230 AN/UYK–7
*UNIVAC 901/1830/1832-A
*Texas Instruments CP-967/UYK

For consideration, please send resume in confidence to:

JOHN CROWLEY

INTEGRATED SYSTEMS SUPPORT, INC.

3330 Pacific Avenue
Virginia Beach, Va. 23451

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SYSTEM DEVELOPMENT CORPORATION

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Requires two to three years experience in performance evaluation and optimization of computer systems; evaluation of system software and application software packages; and conducting feasibility studies for the enhancement of hardware and software. This large organization offers liberal benefits with a starting salary of approximately 13K per annum; depending upon your experience and qualifications.

Send your resume to S.E.G.
Division of
Automated Data Processing
8th St. Office Bldg.
Richmond, Va.

AN EQUAL OPPORTUNITY EMPLOYER

PROGRAMMERS

Several applications programming positions available immediately. To develop financial, educational, and management informations systems on UNIVAC 1106. Experience and B.A. degree desirable. Salary range $10,256 – $16,856, commensurate with experience. Experience preferred in COBOL, FORTRAN, and Assembler on medium-large scale computer. Send resume and salary requirements to **David R. Pagano, Programming Manager, Denver Public Schools, 414 14th Street, Denver, Colo., 80202.**

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Director of University Computing Center

Be responsible for all aspects of university computing center activities:

- Take charge of Univac 1108 – IBM 370/145 installation.
- Aid academic community in instruction, research utilization
- Supervise development, maintenance and operation of administrative services (finances, registration, payroll, etc.)
- Supervise software development and maintenance
- Direct operations including equipment selection
- Manage staff for all of the above activities.

Position requires proven competence, both managerial and technical, at large multi-use computing center: university experience desirable. Benefits include excellent pension and tuition remission plans. Send resume to:

Deputy Chancellor
NEW YORK UNIVERSITY
Elmer Bobst Library
70 Washington Square South
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Affirmative Action – Equal Opportunity Employer, F/M

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PROGRAMMER/ ANALYST

Dartmouth College is expanding its management information procedures (Project FIND) and requires a programmer/analyst to head the software development effort. The position requires broad knowledge of MIS techniques and developments and experience in a large-scale general-purpose time-sharing environment. Persons with experience in BASIC are preferred. Salary to $1100/Mo., commensurate with ability and experience.

Please submit resumes before July 15, 1974 to:

Manager of Employment
Dartmouth College
Box 283
Hanover, New Hampshire 03755

An equal opportunity employer with an affirmative action plan.

Senior Systems Programmer Analyst

Due to an aggressive expansion posture in our data processing department, we have an attractive position for a technically-oriented person to install and support a CRT network for an on-line information retrieval system. Candidate will also be expected to provide in-house consulting and support services for applications programmers, in addition to systems maintenance and operation support.

The ideal candidate will have 4-5 years systems programming experience in an OS/VS environment, of which at least 2 years should have been with teleprocessing support - IMS, CICS or related software systems. Familiarity with ALC and PL 1 necessary.

This position offers an unusually attractive opportunity to the right person. For an immediate appointment, please call (617) 276-5872 or direct your resume with salary requirements to Chuck Richards.

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Northwest/industrial Park
3rd Avenue
Burlington, Mass. 01803

Even Webster's Knows About QUEST

QUEST (kwĕst). v. 1. To make a search; to go on a quest.

QUEST SYSTEMS, INC. n. 1. A corporation founded in 1968. 2. The largest professional recruitment firm in the U.S. functioning solely in the computer sciences; its client companies pay all employment fees, interviewing and relocation expenses. Quest is known for its deep personal commitment to relate to each candidate as an individual with individual goals. 3. Its professional staff averages over 6 years of experience in EDP recruiting (additionally, staff members have direct hands-on experience in programming, systems, hardware sales, etc.) 4. Quest is presently searching for degreed programmers and analysts (commercial, scientific, systems software) for over 3,500 client companies in the U.S. *Quest has openings in over 700 U.S. towns and cities.* 5. Methodology – see Questsystem.

QUESTSYSTEM (kwĕst sis'tĕm). n. 1. Discussing with a man what he would like to be doing in light of what he has been doing. 2. Analyzing the realities of his objectives as they relate to the current job marketplace. 3. Contacting client companies and other Quest staff personnel to identify positions of possible interest. 4. Introducing the job candidate to his prospective employers by providing complete details to each about the other, ensuring the efficacious use of everyone's time. 5. Arranging interviews. 6. If employment offers are extended, Quest assists in evaluating the responsibilities, compensation and opportunities (and relates those to the initially stated objectives). The Questsystem has been working for thousands of professionals at no expense, whatsoever. Ask your friends of their past dealings with Quest. Then, put the Questsystem to work for you. For additional information on this subject, please inquire directly to Quest Systems, Inc. (All inquiries/resumes received will be responded to immediately and in confidence).

QUEST SYSTEMS INC.
6400 Goldsboro Road
Washington, D. C. 20034 (301) 229-4200
Baltimore: (301) 265-1177 • Philadelphia: (215) 667-3322

Programmer/Analyst

We are looking for an E.D.P. professional, well experienced in NCR Century and Neat/3. Manufacturing applications and a degree are pluses. We are a medium sized manufacturing company well established in our field. We are located 75 miles north of N.Y.C. in the rural community of Poughkeepsie. Our company paid benefits package include 12 paid holidays, blue cross, blue shield and major medical. If you are willing to accept a challenging position with ample opportunity to grow professionally in a small E.D.P. dept., send your resume, including salary requirements to: **CW Box 4155, 797 Washington St., Newton, Mass. 02160**

ADMINISTRATIVE PROGRAMMER

Wentworth is seeking programmer experienced in the design and programming of commercial and administrative applications in an educational environment on IBM 1130 and PDP 11/45 computers. The successful candidate should be familiar with Data Base and financial systems written in 1130 FORTRAN with CSP and IDEAL. A knowledge of COBOL would be helpful. Person would also be responsible for system operation for all administrative systems. Include resume and salary requirements. Respond to:

James R. Maiellano
Director of Computer Services
WENTWORTH
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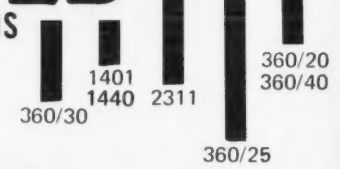

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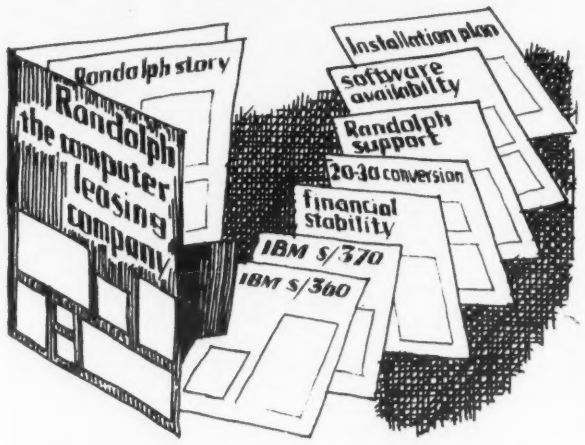

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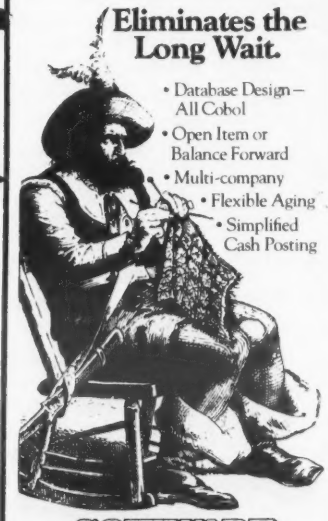

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Thomas L. Ringer, president, made the estimate at the company's annual meeting in answer to a stockholder's question.

Ringer said beginning in 1975, the amount of cash generated from installed inventory will become more important, and by 1976 CMC should not be in a heavy debt position.

Ringer declined, however, to speculate when the company might pay a dividend although a stockholder who said his own question was "frightfully premature" pressed him for a "gut level" feeling.

CMC's 1974 order position at the end of April, Ringer said, was 139% over the same period last year and deliveries for the same period were 125% over the same period in 1973.

Cipher Data Products, which CMC acquired last year, is operating profitably, with most of its products going into the open market, Ringer said.

Cordura Bank Division Sold

BOSTON – First of Boston Computeristics, Inc. has acquired the banking and financial division of Cordura Corp. of Chicago. This includes multibank and multibranch systems for savings accounting, on-line savings and demand deposit accounting.

DCC Reverses Loss, Posts Profit in Year

FAIRFIELD, N.J. – Aided by record sales in the fourth quarter, minimaker Digital Computer Controls, Inc. (DCC) turned from a loss of $345,991 last year to earnings of $110,129 in the year ended Feb. 28.

Sales rose 128% to nearly $1.9 million from $813,368 a year ago.

DCC shipped more minis during the year than in all of its prior history, the firm said.

As of January, about 90% of the firm's sales were to OEMs. President John N. Ackley noted DCC planned to strengthen its efforts in the end-user market, specifically with its ECR 810, targeted for the fast food industry.

...Toward the Bottom Line

Applied Data Research is expecting increases in both revenues and income in 1974 over the 1973 figures of $10.9 million revenues and 32 cents a share earnings, President John R. Bennett predicted.

$$$

National Data Industries' new name is **Selecterm,** in order to maintain a uniform corporate identity. The previous name could not be used in several states, Selecterm said.

$$$

On-Line Systems' ticker symbol ONL is now up in lights on the American Stock Exchange.

$$$

Datum has received four European orders amounting to $5.8 million for its drum memories, cassette transports and formatters.

$$$

Sycor has replaced its $8 million line of credit with a $15 million line with three banks.

Orbis Systems expects sales to total $1.4 million in its second year, President John Ring said. During its first year of business the firm shipped over $365,000 in its Model 74 flexible disk drives.

$$$

Mathematica said it operated on a breakeven basis during the third quarter, primarily due to losses in its Educational Coordinates subsidiary. The firm earned $377,700 in the nine months compared with $384,500 in the year-ago period.

$$$

Dividend time . . . **NCR** will pay a regular quarterly dividend of 18 cents a share payable July 25 to shareholders of record June 14.

Burroughs will pay its 298th dividend of 12.5 cents a share July 20 to shareholders of record June 21.

Computer Election has decided to pay its first dividend since going public in 1972. The 5 cents a share dividend is payable July 15 to shareholders of record June 28.

Acquisitions

Data 100 Corp. has reached a preliminary agreement to acquire **Odec, Inc.** in exchange for Data 100 common stock with a current market value of about $4.8 million. The acquisition would be handled on a tax-free basis and accounted for as a pooling of interests.

The acquisition would enable Data 100 to broaden its program of vertically integrating its product line by manufacturing its own printer mechanisms.

Systems Engineering Corp. has acquired **Automated Computer Services, Inc.** The acquisition included the purchase of all outstanding shares of ACS by Systems Engineering.

Tri-Data Corp. has acquired all the assets and operations of **Data Recognition Corp.**

Automatic Data Processing has agreed to acquire **Hughes Computer Systems, Inc.** for $5 million in cash plus additional payments in cash and stock based upon the future earnings of the acquired company.

Data Card Corp. has agreed to acquire **Cellulose Products Corp.** for an undisclosed amount of cash.

Information Science, Inc. has acquired **Humanic Design Corp.,** which will now be known as the Humanic Designs Division and will provide consulting services to corporate and governmental management concerned with EEO and manpower planning needs.

Comten, Inc. and **Comress, Inc.** have reached preliminary agreement for the merger of Comress into Comten. Under terms of the proposal, each 7.2 shares of Comress common stock would be converted into one share of Comten common.

TEC, Inc. has acquired from Monsanto Co. all of the inventory and tooling for the **Monsanto MDA Series** of LED readout modules for an undisclosed price.

Wyly Corp.'s **Computer Leasing Co.** subsidiary has agreed in principle to acquire **Computer Hardware Consultants and Services, Inc.** Terms of the transactions were not disclosed.

Standard Logic, Inc. has agreed to purchase the 20% minority interest of its **Standard Logic Systems, Inc.** (SLSI) subsidiary from Ronald L. Compton and Daniel N. Robinson. The outstanding shares of SLSI will be exchanged for not more than 25,000 shares of the parent company stock.

Computer Exchange, Inc. has agreed to acquire substantially all the shares of **Systems Resources Corp.** in return for a loan of $250,000. In addition, SRC shareholders will acquire CEI shares according to a formula based on SRC earnings.

Earnings Reports

COMTEN
Three Months Ended March 31

	1974	1973
Revenue	$2,282,375	$1,487,000
Spec Cred	594	.....
Earnings	2,566	(60,642)

ELECTRONIC ASSISTANCE
Three Months Ended April 30

	1974	1973
Shr Ernd	$.07	.....
aRevenue	10,380,000	$8,532,000
Disc Op	.....	(18,000)
Tax Cred	29,000	.....
Earnings	130,000	(137,000)

a-From continuing operations.

WALLACE BUSINESS FORMS
Three Months Ended April 30

	1974	1973
Shr Ernd	$.57	$.35
Revenue	14,178,000	10,213,000
Earnings	1,033,000	635,000
9 Mo Shr	1.49	1.04
Revenue	39,323,000	30,048,000
Earnings	2,708,000	1,882,000

WYLE LABORATORIES
Three Months Ended April 30

	1974	1973
Shr Ernd	$.22	$.24
Revenue	33,907,000	27,769,000
Tax Cred	.....	410,000
Earnings	765,000	838,000

LUNDY ELECTRONICS & SYSTEMS
Nine Months Ended March 31

	1974	1973
Shr Ernd	.....	$.30
Revenue	$12,455,113	12,179,337
Disc Op	.....	(59,026)
Earnings	(523,702)	260,265

ADDRESSOGRAPH MULTIGRAPH
Three Months Ended April 30

	1974	1973
Shr Ernd	$.03	$.40
Revenue	138,647,000	130,480,000
Spec Cred	.....	384,000
Earnings	278,000	3,201,000
9 Mo Shr	.22	1.09
Revenue	389,555,000	351,181,000
Spec Cred	.....	1,214,000
Earnings	1,805,000	8,785,000

MICROFORM DATA SYSTEMS
Three Months Ended May 3

	1974	1973
Shr Ernd	$.07	.....
Revenue	2,846,927	$928,213
Earnings	377,227	(275,807)
9 Mo Shr	.....	.....
Revenue	5,702,389	1,007,352
Loss	29,562	1,148,635

DIGICON
Three Months Ended April 30

	1974	1973
Shr Ernd	$.21	$.11
Revenue	4,861,000	1,826,000
Tax Item	84,000	(8,000)
Earnings	416,000	215,000
9 Mo Shr	.60	.34
Revenue	13,094,000	7,176,000
Tax Cred	332,000	19,000
Earnings	1,197,000	680,000

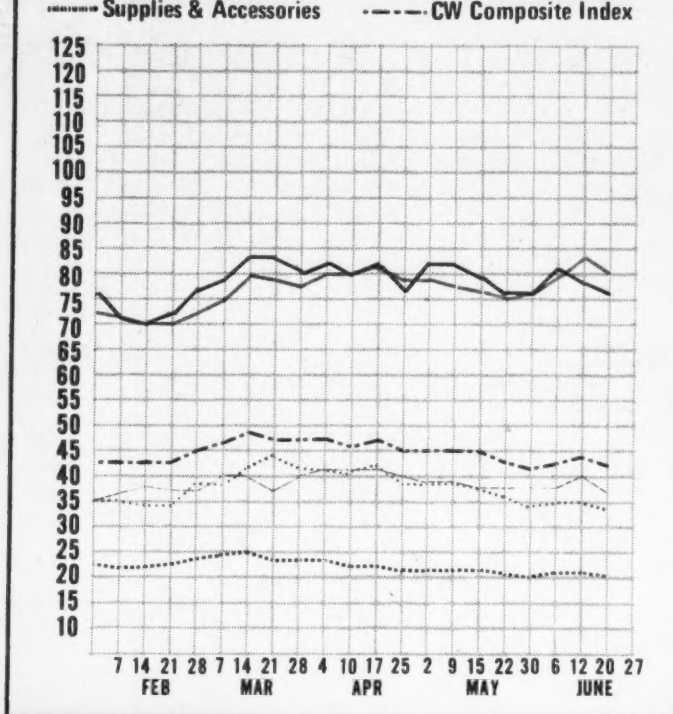
KEYDATA
Three Months Ended April 30

	1974	1973
Shr Ernd	$.06	$.08
Revenue	3,013,000	2,423,000
Tax Cred	83,000	106,000
Earnings	178,000	227,000
9 Mo Shr	.22	.21
Revenue	8,789,000	6,866,000
Tax Cred	283,000	284,000
Earnings	605,000	604,000

DATA PRODUCTS
Year Ended March 31

	1974	1973
Shr Ernd	$1.09	$.34
Revenue	76,258,000	59,789,000
Tax Cred	2,672,000	815,000
Earnings	7,396,000	2,275,000
3 Mo Shr	.27	.16
Revenue	21,850,000	17,950,000
Tax Cred	317,000	321,000
Earnings	1,809,000	1,066,000

COMPUTERWORLD Computer Stocks Trading Indexes



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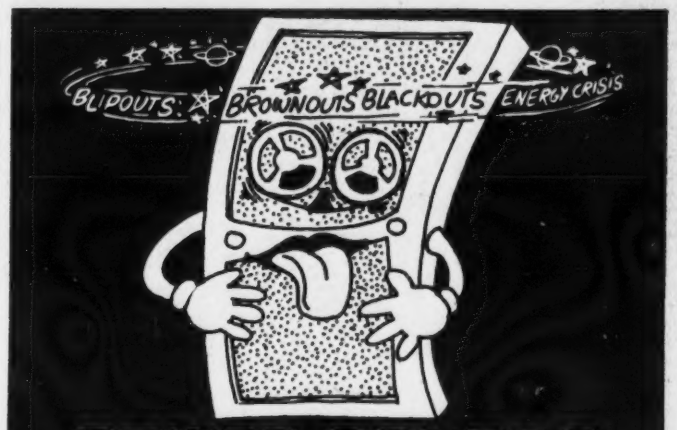

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Computerworld Stock Trading Summary

TRADE*QUOTES

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1973-74 RANGE (1)	CLOSE JUN 20 1974	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	49-126	103 1/2	-5 5/8	-5.1
N	COLLINS RADIO	16- 26	24 3/4	0	0.0
O	COMPUTER AUTOMATION	5- 20	12 5/8	+ 1/8	+1.0
N	CONTROL DATA CORP	27- 62	26 7/8	-3	-10.0
N	DATA GENERAL CORP	28- 49	33 7/8	- 3/4	-2.1
O	DATAPOINT CORP	10- 21	11 1/4	- 3/4	-6.2
O	DIGITAL COMP CONTROL	2- 6	3	- 5/8	-17.2
N	DIGITAL EQUIPMENT	73-121	110 1/2	+2 1/4	+2.0
N	ELECTRONIC ASSOC.	2- 9	2 1/2	+ 1/4	+11.1
A	ELECTRONIC ENGINEER.	6- 14	8 3/4	0	0.0
N	FOXBORO	23- 48	28 3/4	+1 3/4	+6.4
O	GENERAL AUTOMATION	22- 55	35 3/4	-1	-2.7
O	GRI COMPUTER CORP	1- 3	7/8	0	0.0
N	HEWLETT-PACKARD CO	70- 99	85 7/8	-3 5/8	-4.0
N	HONEYWELL INC	55-139	55 1/4	-13 3/4	-19.9
N	IBM	211-340	213 3/4	-11	-4.8
O	INTERDATA INC	7- 22	20 3/8	+ 1/4	+1.2
O	MICRODATA CORP	2- 10	4 5/8	+ 3/4	+19.3
N	NCR	27- 46	32 1/8	-2 1/2	-7.2
N	RAYTHEON CO	22- 39	32 1/8	-2 3/8	-6.8
N	SINGER CO	30- 74	29 5/8	-2 3/8	-7.4
N	SPERRY RAND	36- 56	37 7/8	-3 1/8	-7.6
A	SYSTEMS ENG. LABS	1- 8	1 7/8	0	0.0
N	TEXAS INSTRUMENTS	83-138	92 3/8	-1 1/8	-1.2
O	ULTIMACC SYSTEMS INC	1- 11	1 3/8	0	0.0
N	VARIAN ASSOCIATES	9- 20	9	0	0.0
N	WANG LABS.	11- 34	12 3/4	-1 1/4	-8.9
N	XEROX CORP	106-169	117 3/8	-7 7/8	-6.2
	LEASING COMPANIES				
A	BOOTHE COMPUTER	1- 5	1 1/8	0	0.0
O	BRESNAHAN COMP	1- 2	2 1/8	0	0.0
O	COMDISCO INC	2- 17	3 1/4	+ 1/4	+8.3
A	COMMERCE GROUP CORP	3- 6	3 3/4	- 1/8	-3.2
O	COMPUTER EXCHANGE	1- 1	1/8	0	0.0
A	COMPUTER INVSTRS GRP	2- 8	1 5/8	- 1/8	-7.1
O	COMP. INSTALLATIONS	1- 2	1	0	0.0
M	DATRONIC RENTAL	1- 3	1	0	0.0
A	DCL INC	0- 3	3/8	0	0.0
N	DPF INC	3- 9	3 5/8	- 1/8	-3.3
O	EDP RESOURCES	1- 3	3 1/4	0	0.0
A	GRANITE MGT	1- 6	1 3/8	+ 1/8	+10.0
A	GREYHOUND COMPUTER	3- 6	3 1/2	0	0.0
A	ITEL	4- 12	4 1/4	- 5/8	-12.8
N	LEASCO CORP	8- 18	9 3/8	- 3/4	-7.4
O	LEASPAC CORP	1- 8	1 1/4	+ 1/8	+11.1
O	LECTRO MGT INC	1- 2	3/8	0	0.0
O	NRG INC	3- 15	3 1/8	- 1/4	-7.4
A	PIONEER TEX CORP	2- 10	3	0	0.0
A	ROCKWOOD COMPUTER	1- 3	3/4	0	0.0
N	U.S. LEASING	12- 34	14 1/4	-2 1/8	-12.9

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		1973-74 RANGE (1)	CLOSE JUN 20 1974	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1	0	0.0
A	APPLIED DATA RES.	2- 4	1 7/8	- 3/8	-16.6
O	APPLIED LOGIC	1- 3	1/8	0	0.0
N	AUTOMATIC DATA PROC	29- 94	29	-4 3/4	-14.0
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	3- 9	4 1/4	- 1/2	-10.5
O	COMPUTER DIMENSIONS	1- 5	1 3/4	- 1/4	-12.5
O	COMPUTER HORIZONS	1- 6	2	- 1/4	-11.1
O	COMPUTER NETWORK	1- 5	1 1/8	- 1/4	-18.1
N	COMPUTER SCIENCES	2- 6	2 3/4	- 3/8	-12.0
O	COMPUTER TASK GROUP	1- 2	3/8	- 1/8	-25.0
O	COMPUTER TECHNOLOGY	1- 3	1/2	0	0.0
O	COMPUTER USAGE	3- 9	3 1/2	0	0.0
O	COMRESS	1- 2	1/2	0	0.0
O	COMSHARE	2- 9	3 1/8	+ 1/8	+4.1
N	CORDURA CORP	2- 15	3 3/8	0	0.0
O	DATATAB	1- 4	2	0	0.0
A	ELECT COMP PROG	1- 2	1/8	- 1/8	-50.0
N	ELECTRONIC DATA SYS.	12- 56	15 1/2	- 3/4	-4.6
O	INFONATIONAL INC	1- 2	1/2	0	0.0
O	I.D.A. DATA CORP	1- 1	3/8	0	0.0
O	IPS COMPUTER MARKET.	1- 5	3/4	- 1/8	-14.2
O	KEANE ASSOCIATES	2- 5	3 1/2	0	0.0
O	KEYDATA CORP	3- 12	3	- 1/8	-4.0
O	LOGICON	2- 7	3 1/8	- 1/8	-3.8
A	MANAGEMENT DATA	1- 5	1 1/4	- 1/8	-9.0
O	NATIONAL CSS INC	17- 42	17 1/2	-3 1/2	-16.6
O	NATIONAL COMPUTER CO	1- 1	1/4	- 1/8	-33.3
O	NATIONAL INFO SRVCS	1- 2	1/8	0	0.0
A	ON LINE SYSTEMS INC	12- 31	28 7/8	+ 1/4	+0.8
N	PLANNING RESEARCH	2- 7	2 3/4	- 1/8	-4.3
O	PROGRAMMING METHODS	17- 25	17	0	0.0
O	PROGRAMMING & SYS	1- 1	3/4	0	0.0
O	RAPIDATA INC	2- 24	2 3/4	0	0.0
O	SCIENTIFIC COMPUTERS	1- 3	7/8	0	0.0
O	SIMPLICITY COMPUTER	1- 4	7/8	- 1/8	-12.5
O	TCC INC	1- 1	1/4	0	0.0
O	TYMSHARE INC	6- 13	10 5/8	- 3/4	-6.5
O	UNITED DATA CENTER	3- 6	2 3/4	0	0.0
A	URS SYSTEMS	2- 8	2 3/8	- 1/8	-5.0
N	WYLY CORP	3- 11	3 3/8	- 1/8	-3.5
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	5- 34	5 1/8	- 1/2	-8.8
O	ADVANCED MEMORY SYS	3- 23	3 1/8	- 1/4	-7.4
N	AMPEX CORP	3- 7	3 3/8	- 1/4	-6.8
O	ANDERSON JACOBSON	2- 6	2 1/2	- 1/4	-9.0
O	BEEHIVE MEDICAL ELEC	3- 10	3 1/2	+ 1/4	+7.6
A	BOLT,BERANEK & NEW	6- 12	7 5/8	- 3/8	-4.6
N	BUNKER-RAMO	6- 18	6 1/8	- 5/8	-9.2
A	CALCOMP	5- 16	8 3/4	- 7/8	-9.0
O	CAMBRIDGE MEMORIES	7- 17	7 3/8	-1 3/8	-15.7
O	CENTRONICS DATA COMP	13- 38	17 1/4	- 3/4	-4.1
O	CODEX CORP	8- 19	12 1/4	+ 1/4	+2.0
O	COGNITRONICS	1- 3	1	- 1/4	-20.0
O	COMPUTER COMMUN.	1- 4	5/8	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 3/8	- 1/8	-8.3
O	COMPUTER MACHINERY	3- 13	3 1/4	- 1/2	-13.3
O	COMPUTER TRANSCEIVER	1- 6	1 5/8	+ 3/8	+30.0
N	CONRAC CORP	13- 32	16 1/2	-1 1/8	-6.3
O	DATA ACCESS SYSTEMS	1- 3	2 1/2	+ 5/8	+33.3
O	DATA 100	9- 19	9 3/4	- 3/8	-3.7
A	DATA PRODUCTS CORP	2- 5	3 3/8	- 1/4	-6.8
O	DATA RECOGNITION	1- 3	1/4	0	0.0
O	DATA TECHNOLOGY	1- 5	3 1/8	0	0.0
O	DECISION DATA COMPUT	6- 40	6 3/4	+ 3/8	+5.8
O	DELTA DATA SYSTEMS	1- 1	3/4	0	0.0
O	DIVAN CONTROLS	1- 4	5/8	+ 1/8	+25.0
N	ELECTRONIC M & M	3- 6	2 1/2	- 1/8	-4.7
O	FARRI-TEK	2- 5	2	- 1/8	-5.8
O	GENERAL COMPUTER SYS	2- 9	2 1/2	+ 1/2	+25.0
N	GENERAL ELECTRIC	48- 76	48 1/4	-2 1/4	-4.4
N	HAZELTINE CORP	4- 9	4 1/4	- 3/8	-8.1
O	INFOREX INC	2- 23	2 1/8	0	0.0
O	INFORMATION DISPLAYS	1- 2	1/4	0	0.0
O	INFORMATION INTL INC	8- 15	10 1/4	- 3/4	-6.8
A	LUNDY ELECTRONICS	3- 9	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/4	0	0.0
N	MEMOREX	2- 19	4 1/8	- 1/8	-2.9
A	MILGO ELECTRONICS	9- 28	10 5/8	- 3/8	-3.4
N	MOHAWK DATA SCI	2- 13	2 5/8	+ 1/4	+10.5
O	ONEC COMPUTER SYST.	2- 6	1 3/4	- 1/4	-12.5
O	OPTICAL SCANNING	2- 8	4 1/2	- 3/4	-14.2
O	PERTEC CORP	3- 8	3	+ 1/4	+9.0
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTRUMENT	2- 9	2 3/4	- 3/8	-12.0
O	PRECISION INST.	2- 6	1 1/4	0	0.0
O	QUANTOR CORP	4- 10	4 1/4	- 1/4	-5.5
O	RECOGNITION EQUIP	2- 8	2 7/8	- 3/8	-11.5
N	SANDERS ASSOCIATES	4- 18	3 7/8	- 1/2	-11.4
O	SCAN DATA	1- 6	1 1/2	0	0.0
O	STORAGE TECHNOLOGY	11- 34	11 1/2	- 3/4	-6.1
O	SYCOR INC	7- 20	8 1/4	- 1/4	-2.9
O	TALLY CORP.	2- 14	3	- 1/8	-4.0
O	TEC INC	4- 9	4 1/4	0	0.0
N	TEKTRONIX INC	30- 55	42	+ 3/8	+0.9
N	TELEX	3- 8	2 5/8	- 1/8	-4.5
O	WANGCO INC	7- 13	9 1/2	- 1/2	-5.0
O	WILTEK INC	5- 18	5 1/2	+ 3/8	+7.3
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 9	5	- 1/4	-4.7
A	BARRY WRIGHT	5- 13	5	- 3/8	-6.9
O	CYBERNATICS INC	1- 3	1 1/8	- 1/8	-10.0
A	DATA DOCUMENTS	17- 50	49 1/4	+ 1/4	+0.5
O	DUPLEX PRODUCTS INC	6- 16	14 3/4	-1 1/4	-7.8
N	ENNIS BUS. FORMS	5- 8	6 1/2	- 3/8	-5.4
O	GRAHAM MAGNETICS	7- 20	7 3/4	- 1/4	-3.1
O	GRAPHIC CONTROLS	7- 12	9 3/4	0	0.0
N	3M COMPANY	69- 91	74 3/4	-2 7/8	-3.7
O	MOORE CORP LTD	48- 65	52 1/4	-1	-1.8
N	NASHUA CORP	32- 58	38 5/8	- 5/8	-1.5
O	REYNOLDS & REYNOLD	23- 51	24	- 1/2	-2.0
O	STANDARD REGISTER	11- 20	14 3/4	0	0.0
O	TAB PRODUCTS CO	6- 23	6 1/4	0	0.0
N	UARCO	15- 23	20 3/4	-1 1/4	-5.6
A	WABASH MAGNETICS	5- 8	5 3/8	- 1/8	-2.2
N	WALLACE BUS FORMS	14- 26	23	- 1/4	-1.0

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- 20 Manufacturer (other)
- 30 DP Service Bureau/Software/Planning/Consulting
- 40 Public Utility/Communication Systems/Transportation
- 50 Wholesale/Retail Trade
- 60 Finance/Insurance/Real Estate
- 70 Mining/Construction/Petroleum/ Refining
- 75 Business Service (except DP)
- 80 Education/Medicine/Law
- 85 Government - Federal/State/Local
- 90 Printing/Publishing/ Other Communication Service
- 95 Other: _____

TITLE/OCCUPATION/FUNCTION
- 11 President/Owner/Partner/General Manager
- 12 VP/Assistant VP
- 13 Treasurer/Controller/Finance Officer
- 21 Director/Manager of Operation/Planning/ Administrative Service
- 22 Director/Manager/Supervisor DP
- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 41 Application Engineer
- 42 Other Engineering
- 51 Mfg Sales Representative
- 52 Other Sales/Marketing
- 60 Consultant
- 70 Lawyer/Accountant
- 80 Librarian/Educator/Student
- 90 Other: _____

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